

Application to Commit Energy
Efficiency/Peak Demand
Reduction Programs
(Mercantile Customers Only)

Case No.: <u>12-0835--E</u>L-EEC

Mercantile Customer: Valley Asphalt

Electric Utility: **Duke Energy**

Program Title or

Description: Multiple VFD Projects

Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), permits a mercantile customer to file, either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs. The following application form is to be used by mercantile customers, either individually or jointly with their electric utility, to apply for commitment of such programs in accordance with the Commission's pilot program established in Case No. 10-834-EL-POR

Completed applications requesting the cash rebate reasonable arrangement option (Option 1) in lieu of an exemption from the electric utility's energy efficiency and demand reduction (EEDR) rider will be automatically approved on the sixty-first calendar day after filing, unless the Commission, or an attorney examiner, suspends or denies the application prior to that time. Completed applications requesting the exemption from the EEDR rider (Option 2) will also qualify for the 60-day automatic approval so long as the exemption period does not exceed 24 months. Rider exemptions for periods of more than 24 months will be reviewed by the Commission Staff and are only approved up the issuance of a Commission order.

Complete a separate application for each customer program. Projects undertaken by a customer as a single program at a single location or at various locations within the same service territory should be submitted together as a single program filing, when possible. Check all boxes that are applicable to your program. For each box checked, be sure to complete all subparts of the question, and provide all requested additional information. Submittal of incomplete applications may result in a suspension of the automatic approval process or denial of the application.

Any confidential or trade secret information may be submitted to Staff on disc or via email at <u>ee-pdr@puc.state.oh.us</u>.

Section 1: Mercantile Customer Information

Name: Valley Asphalt Corporation

Principal address: 11641 Mosteller Rd Cincinnati, Ohio 45241

Address of facility for which this energy efficiency program applies:

309 Industrial Dr, Franklin Ohio 45005 4850 Stubbs Mill Rd, Morrow OH 45152 581 Garver Rd, Monroe OH 45050 7940 Main St, Newtown Ohio 45244 Kilby Rd, Cleves Ohio 45002

Name and telephone number for responses to questions:

Grady Reid, Jr Duke Energy 513-287-1038

Electricity use by the customer (check the box(es) that apply):

- ✓ The customer uses more than seven hundred thousand kilowatt hours per year at the above facility. (Refer to Appendix A for documentation.)
- ☐ The customer is part of a national account involving multiple facilities in one or more states. (Please attach documentation.)

Section 2: Application Information

- A) The customer is filing this application (choose which applies):
 - $\ \square$ Individually, without electric utility participation.
 - **✓** Jointly with the electric utility.
- B) The electric utility is: **Duke Energy**
- C) The customer is offering to commit (check any that apply):
 - □ Energy savings from the customer's energy efficiency program. (Complete Sections 3, 5, 6, and 7.)
 - □ Capacity savings from the customer's demand response/demand reduction program. (Complete Sections 4, 5, 6, and 7.)
 - ✓ Both the energy savings and the capacity savings from the customer's energy efficiency program. (Complete all sections of the Application.)

Section 3: Energy Efficiency Programs

- A) The customer's energy efficiency program involves (check those that apply):
 - Early replacement of fully functioning equipment with new equipment. (Provide the date on which the customer replaced fully functioning equipment, and the date on which the customer would have replaced such equipment if it had not been replaced early. Please include a brief explanation for how the customer determined this future replacement date (or, if not known, please explain why this is not known)).

The following new equipment was installed starting December 2009 and was finished May 2010.

1 VFD on 100HP exhaust fan - 309 Industrial Dr 1 VFD on100 HP exhaust fan - 4850 Stubbs Mill Rd 1 VFD on100 HP exhaust fan - 581 Garver Rd 1 VFD on 100 HP exhaust fan - 7940 Main St 1 VFD on100 HP exhaust fan - Kilby Rd

- ☐ Installation of new equipment to replace equipment that needed to be replaced The customer installed new equipment on the following date(s):
- Installation of new equipment for new construction or facility expansion.
 The customer installed new equipment on the following date(s):
- □ Behavioral or operational improvement.
- B) Energy savings achieved/to be achieved by the energy efficiency program:
 - 1) If you checked the box indicating that the project involves the early replacement of fully functioning equipment replaced with new equipment, then calculate the annual savings [(kWh used by the original equipment) (kWh used by new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:

Annual savings: 348,242 kWh (Refer to Appendix B for calculations and supporting documents).

2) If you checked the box indicating that the customer installed new equipment to replace equipment that needed to be replaced, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh

	used by the higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:
	Annual savings:kWh
	Please describe any less efficient new equipment that was rejected in favor of the more efficient new equipment.
3)	If you checked the box indicating that the project involves equipment for new construction or facility expansion, then calculate the annual savings [(kWh used by less efficient new equipment) – (kWh used by higher efficiency new equipment) = (kWh per year saved)]. Please attach your calculations and record the results below:
	Annual savings:kWh
	Please describe the less efficient new equipment that was rejected in favor of the more efficient new equipment.
4)	If you checked the box indicating that the project involves behavioral or operational improvements, provide a description of how the annual savings were determined.

Section 4: Demand Reduction/Demand Response Programs

- A) The customer's program involves (check the one that applies):
 - ✓ Coincident peak-demand savings from the customer's energy efficiency program.
 - Actual peak-demand reduction. (Attach a description and documentation of the peak-demand reduction.)
 - □ Potential peak-demand reduction (check the one that applies):
 - ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a tariff of a regional transmission organization (RTO) approved by the Federal Energy Regulatory Commission.
 - ☐ The customer's peak-demand reduction program meets the requirements to be counted as a capacity resource under a program that is equivalent to an RTO program, which has been approved by the Public Utilities Commission of Ohio.
- B) On what date did the customer initiate its demand reduction program?

New equipment was installed starting December 2009 and was finished May 2010.

C) What is the peak demand reduction achieved or capable of being achieved (show calculations through which this was determined):

33.6 kW

Refer to Appendix B for calculations and supporting documents.

Section 5: Request for Cash Rebate Reasonable Arrangement (Option 1) or Exemption from Rider (Option 2)

Under this section, check the box that applies and fill in all blanks relating to that choice.

Note: If Option 2 is selected, the application will not qualify for the 60-day automatic approval. All applications, however, will be considered on a timely basis by the Commission.

- A) The customer is applying for:
 - **✓** Option 1: A cash rebate reasonable arrangement.

OR

Option 2: An exemption from the energy efficiency cost recovery mechanism implemented by the electric utility.

OR

✓ Commitment payment

Certain projects completed by Valley Asphalt have payback below one year and, as such, qualify only for commitment payments. The remainder of projects received cash rebates. Details are outlined in Appendix C.

- B) The value of the option that the customer is seeking is:
 - Option 1: A cash rebate reasonable arrangement, which is the lesser of (show both amounts):
 - □ A cash rebate of \$3200.00. Refer to Appendix C for documentation. (Rebate shall not exceed 50% project cost. Attach documentation showing the methodology used to determine the cash rebate value and calculations showing how this payment amount was determined.)
 - Option 2: An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider.
 - An exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for ____ months (not to exceed 24 months). (Attach calculations showing how this time period was determined.)

OR

✓ A commitment payment valued at no more than \$1216.00. Refer to Appendix C for documentation (Attach documentation and calculations showing how this payment amount was determined.)

OR

Ongoing exemption from payment of the electric utility's energy efficiency/peak demand reduction rider for an initial period of 24 months because this program is part of the customer's ongoing efficiency program. (Attach documentation that establishes the ongoing nature of the program.) In order to continue the exemption beyond the initial 24 month period, the customer will need to provide a future application establishing additional energy savings and the continuance of the organization's energy efficiency program.)

Section 6: Cost Effectiveness

The program is cost effective because it has a benefit/cost ratio greater than 1 using the (choose which applies):

Total Resource Cost (TRC) Test.	The calculated TRC value is:	
(Continue to Subsection 1, then ski	p Subsection 2)	

□ Utility Cost Test (UCT) . The calculated UCT value is: **25.57** (Skip to Subsection 2.) **Refer to Appendix D for calculations and supporting documents.**

Subsection 1: TRC Test Used (please fill in all blanks).

The TRC value of the program is calculated by dividing the value of our avoided supply costs (generation capacity, energy, and any transmission or distribution) by the sum of our program overhead and installation costs and any incremental measure costs paid by either the customer or the electric utility.

The electric utility's avoided supply costs were	·
Our program costs were	

The incremental measure costs were _____. Subsection 2: UCT Used (please fill in all blanks).

We calculated the UCT value of our program by dividing the value of our avoided supply costs (capacity and energy) by the costs to our electric utility (including administrative costs and incentives paid or rider exemption costs) to obtain our commitment.

Our avoided supply costs were \$232,586.

The utility's program costs were \$4680.

The utility's incentive costs/rebate costs were \$4416.

Section 7: Additional Information

Please attach the following supporting documentation to this application:

Narrative description of the program including, but not limited to, make, model, and year of any installed and replaced equipment.

A copy of the formal declaration or agreement that commits the program or measure to the electric utility, including:

- 1) any confidentiality requirements associated with the agreement;
- 2) a description of any consequences of noncompliance with the terms of the commitment;
- 3) a description of coordination requirements between the customer and the electric utility with regard to peak demand reduction;
- 4) permission by the customer to the electric utility and Commission staff and consultants to measure and verify energy savings and/or peak-demand reductions resulting from your program; and,
- 5) a commitment by the customer to provide an annual report on your energy savings and electric utility peak-demand reductions achieved.

Refer to Rebate Offer letter following this application

A description of all methodologies, protocols, and practices used or proposed to be used in measuring and verifying program results. Additionally, identify and explain all deviations from any program measurement and verification guidelines that may be published by the Commission.

Please indicate your response to this rebate offer within 30 days of receipt.								
Rebate is accepted.	Rebate is decline	ed.						
efficiency projects listed on the f	By accepting this rebate, Valley Asphalt affirms its intention to commit and integrate the energy efficiency projects listed on the following pages into Duke Energy's peak demand reduction, lemand response and/or energy efficiency programs.							
Additionally, Valley Asphalt also secure approval of this arranger reporting requirements imposed	ment as required by PUCO and	cant in any future filings necessary to d to comply with any information and oval.						
this rebate offer is true and accu project scope, equipment specifi	Finally, Valley Asphalt affirms that all application information submitted to Duke Energy pursuant to his rebate offer is true and accurate. Information in question would include, but not be limited to, project scope, equipment specifications, equipment operational details, project costs, project completion dates, and the quantity of energy conservation measures installed.							
If rebate is accepted, will you us reduction projects?	e the monies to fund future en	nergy efficiency and/or demand						
☑YES □ NO								
f rebate is declined, please indicate reason (optional):								
Fuel Branner	FRED BRAMMER	1-24-12						
Customer Signature	Printed Name	Date						

Proposed Rebate Amounts

Measure ID	Energy Conservation Measure (ECM)	Proposed Rebate Amount
ECM-1	VFD Heating Exhaust Fan (Qty 1 – 309 Industrial Dr)	\$450.00
ECM-2	VFD Heating Exhaust Fan (Qty 1 – 4850 Stubbs Mill Rd)	\$1600.00
ECM-3	VFD Heating Exhaust Fan (Qty 1 –581 Garver Rd)	\$389.00
ECM-4	VFD Heating Exhaust Fan (Qty 1 – 7940 Main)	\$1600.00
ECM-5	VFD Heating Exhaust Fan (Qty 1 – Kilby Rd)	\$377.00
Total		\$4416.00

Ohio | Public Utilities Commission

Application to Commit Energy Efficiency/Peak Demand Reduction Programs (Mercantile Customers Only)

> Notary Public, State of Ohio My Commission Expires 03-31-2015

Only)
Case No.:EL-EEC
State of Ohio:
Fred Brammer, Affiant, being duly sworn according to law, deposes and says that:
1. I am the duly authorized representative of:
And Brammer
[insert customer or EDU company name and any applicable name(s) doing business as]
2. I have personally examined all the information contained in the foregoing application, including any exhibits and attachments. Based upon my examination and inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete.
3. I am aware of fines and penalties which may be imposed under Ohio Revised Code Sections 2921.11, 2921.31, 4903.02, 4903.03, and 4903.99 for submitting false information.
La Barris Suit
Signature of Affiant & Title
Sworn and subscribed before me this 24th day of January, 2012 Month/Year Diane Carol Johnson
Signature of official administering oath Print Name and Title Notary Publ Publ Diane Carol Johnson

My commission expires on March 31, 2015

Appendix A

43903686 01		
VALLEY ASPHALT CORP		
589 GARVER RDMISC: C		
MONROE, OH 45050		
Date	Days	Actual KWH
11/3/2011	29	1,734
10/5/2011	29	1,514
9/6/2011	32	1,948
8/5/2011	29	1,187
7/7/2011	30	1,547
6/7/2011	32	2,252
5/6/2011	30	2,365
4/6/2011	29	2,924
3/8/2011	29	5,633
2/7/2011	31	9,994
1/7/2011	32	11,192
12/6/2010	33	44,032
Total		86,322

08403616 01				
VALLEY ASPHA	VALLEY ASPHALT CORP			
4850 STUBBSN	IILL RD			
MORROW, OH	45152			
Date	Days	Actual KWH		
11/1/2011	29	62,760		
10/3/2011	32	39,000		
9/1/2011	28	38,160		
8/4/2011	30	37,920		
7/5/2011	32	57,000		
6/3/2011	30	33,360		
5/4/2011	30	13,080		
4/4/2011	31	3,600		
3/4/2011	29	4,080		
2/3/2011	29	5,640		
1/5/2011	33	6,480		
12/3/2010	32	25,560		
Total		326,640		

39003692 01		
VALLEY ASPHALT CORP		
5073 KILBY RDBOX: B		
CLEVES, OH 45002		
Date	Days	Actual KWH
11/7/2011	31	50,229
10/7/2011	29	46,839
9/8/2011	30	35,609
8/9/2011	29	54,814
7/11/2011	32	68,838
6/9/2011	30	36,666
5/10/2011	32	25,009
4/8/2011	29	11,536
3/10/2011	29	10,246
2/9/2011	29	12,697
1/11/2011	34	13,557
12/8/2010	33	55,164
Total		421,204

84103711 01		
VALLEY ASPHA		
309 INDUSTRIA	AL DR	
FRANKLIN, OH	45005	
Date	Days	Actual KWH
11/15/2011	29	85,544
10/17/2011	31	125,573
9/16/2011	30	134,870
8/17/2011	29	110,578
7/19/2011	32	83,116
6/17/2011	30	44,650
5/18/2011	30	20,093
4/18/2011	31	20,850
3/18/2011	29	4,754
2/17/2011	29	5,652
1/19/2011	34	5,323
12/16/2010	31	50,377
Total		691,380

27302143 01						
VALLEY ASPHALT CO						
7940 MAIN						
CINCINNATI, OH 45244						
Bulked consumption fro	m 5-19-	11 for meter	# 94273581	& 106939983 -	Rate - DS	
Date	Days	Actual KWH				
11/16/2011	29	44,123				
10/18/2011	29	53,934				
9/19/2011	32	49,539				
8/18/2011	29	59,664				
7/20/2011	30	27,521				
6/20/2011	32	32,290				
Total		267,071				

See Appendix B At The End

Appendix C -Commitment Payment

	Total Energy	Total Demand			
	Savings (kWh) AT	Saving kW At The			
Measure/Location	THE METER	Meter	Commitment Payment Per kWh*	Commitment Payment Per kW*	Payment
VFD - 309 Industrial Dr, Franklin OH	78,959	7	0.005	\$10	\$450.00
VFD - 581 Garver Rd, Monroe OH	66,637	7	0.005	\$10	\$389.00
VFD - Kilby Rd, Cleves OH	61,972	7	0.005	\$10	\$377.00
					\$1,216.00

Note: Commitment payment is proposed for measures with payback < 1 year, per PUCO ruling. The calculation does not hold exactly due to energy modeling software error.

Note: kWh savings in the above table may differ slightly from applicant calculations due to avoided cost modeling rounding error.

Appendix C -Cash Rebate Calculation

VFD

Measure	Quantity	Cash Rebate Rate	Rebate
		50% of incentive that would be offered by	
VFD - 4850 Stubbs Mill Rd, Morrow OH	1	the Smart Saver Custom program	\$1,600
		50% of incentive that would be offered by	
VFD- 7940 Main St, Newtown OH	1	the Smart \$aver Custom program	\$1,600
		Tota	\$3,200.00

Total Rebate \$4,416.00

Appendix D -UCT Value

VFD

Measure	Total Avoided Cost	Program Cost	Incentive	Quantity	Measure UCT
VFD - 309 Industrial Dr, Franklin OH	\$51,924	\$803	\$389	1	43.56
VFD - 4850 Stubbs Mill Rd, Morrow OH	\$43,411	\$680	\$377	1	41.07
VFD - 581 Garver Rd, Monroe OH	\$44,632	\$1,214	\$1,600	1	15.86
VFD- 7940 Main St, Newtown OH	\$49,887	\$1,292	\$1,600	1	17.25
VFD - Kilby Rd, Cleves OH	\$42,732	\$691	\$450	1	37.45
Totals	\$232,586	\$4,680	\$4,416	5	

Total Avoided Supply Costs \$232,586
Total Program Costs \$4,680.00
Total Incentive \$4,416

Aggregate Application UCT

25.57

Appendix B - Energy Savings Achieved

	Pre-Proje	ct (at the meter	·)	Post	-Project (at the	meter)	Savings (at	the meter)
ECM	As-Found Equipment	Total Annual kWh ¹	Summer Coincident kW ¹	New Equipment	Total Annual kWh ¹	Summer Coincident kW ²	Energy Savings (kWh)	Demand Savings (kW) ²
ECM1	100HP Conveyor Motor – Kilby Rd Site	197,276	67.1	VFD Added	135,303	60.4	61,972	6.7
ECM2	100HP Conveyor Motor – Main St Site	206,670	67.1	VFD Added	130,396	60.4	76,274	6.7
ECM3	100HP Conveyor Motor – Industrial Dr Site	211,367	67.1	VFD Added	132,407	60.4	78,959	6.7
ECM4	100HP Conveyor Motor – Garver Rd Site	192,914	67.1	VFD Added	126,277	60.4	66,637	6.7
ECM5	100HP Conveyor Motor – Stubbs Mill Rd Site	187,613	67.1	VFD Added	123,214	60.4	64,399	6.7
						Total	348,242	33.6

Notes:

- 1. Energy consumption baseline, demand baseline and post-project energy consumption basis are outlined in the following pages.
- 2. Demand savings are returned by DSMore software as a result of energy savings allocations at the coincident hour. Post-project demand is calculated as the difference between pre-project modeled demand and the DSMore software result. An exception occurs where it was identified that the addition of the VFD introduces the possibility of a demand increase at the coincident hour. In these cases, the expected demand increase is applied.

Application of 7.43% line losses yields **364,037 kWh** savings and **36.0 coincident kW** savings at the plant. This number also reflects insignificant rounding error due to the analytical mode used to model this project in DSMore software.

NOTE: all information per the "2011-12-13 Revised Part 2.pdf" file	2011-12-13 Revised Po	3 Revised Pc	th (see Notes:	sed Pc	A PC				3 8 4 40 5 5 0 5 0 5 1 1 1 1 1 1 1 1 1 1 1 1 1	3 8 4)	177 2	1rt 2.k	1rt 2.pu	17t 2.pd	18.4 Oct 40 32(80 42) Oct 74(80 7)(8	1rt 2.pdf" 3 & 4) 0 Oct 20 744 20 744 80 70 0 Oct	1rt 2.pdf" 3 & 4) 0 oct 40 320 80 424 20 744 20 76 65 66 65 66 65 66 64 64 64 74 64 75 65 76 65 76 65 77 65 78 6	1rt 2.pdf" 38.4 320	3.8.4) 3.8.4) 3.8.4) 3.0.0t 40.320 3.0.0t 3.0t 3
tion per the "2011	2011	!-12-12	ring the mon	1-12-13 Revi	1-12-13 Revised ring the month (see N	1-12-13 Revised P ring the month (see Note: 325 400 419 344 744 744	I-12-13 Revised Paring the month (see Notes and a see	1-12-13 Revised Par ring the month (see Notes 3 8 4 4 9 4 19 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ring the month (see Notes 3 & 4 10 325 400 340 340 340 340 344 380 744 720 340 340 340 340 340 340 340 340 340 34	ring the month (see Notes 3 & 4) Jul Aug Sep 325 400 340 744 744 720 Uns during the period (see Note 10)	1-12-13 Revised Part 2 ring the month (see Notes 3 & 4) Jul Aug Sep 325 400 340 419 344 380 744 744 720 Jul Aug Sep Jul Aug Sep	1-12-13 Revised Part 2 Ing the month (see Notes 3 & 4) Jul Aug Sep 419 344 380 744 744 720 Jul Aug Sep Jul Aug Sep	ring the month (see Notes 3 & 4) Jul	ring the month (see Notes 3 & 4) Jul Aug Sep 325 400 340 340 340 341 380 744 744 720 Jul Aug Sep Jul Aug Sep Jul Aug Sep 55 60 65	ring the month (see Notes 3 & 4) Jul Aug Sep 325 400 340 340 340 341 380 744 744 720 Jul Aug Sep Jul Aug Sep Jul Aug Sep Jul Aug Sep 56 65 75 66 65 75 76 75 80 67 77 75 80 67 78 80 68 65 78 80 69 80 69 80 60 8	I-12-13 Revised Part 2 Ing the month (see Notes 3 & 4) Jul Aug Sep 419 344 380 744 744 720 Jul Aug Sep Jul Aug Sep Jul Aug Sep 56 65 75 65 65 75 65 65 75 65 65 75 65 65 75 65 65 75 65 65 75 65 65 75 66 65 75 67 75 75 68 65 75 68 75	1-12-13 Revised Part 2 325 340 3	ring the month (see Notes 3 & 4) Jul	ring the month (see Notes 3 & 4) Jul
		each motor runs during the	otor runs durin	each motor runs during the m	each motor runs during the magnetic mag	each motor runs during the market mar	each motor runs during the m May Jun Jul 315 310 325 429 410 419 744 720 744	each motor runs during the m May Jun Jul 315 310 325 429 410 419 744 720 744	that each motor runs during the month (see Notes 3 & 4) T May Jun Jul Aug Sep Oct 340 340 32 T May 410 315 400 340 32 TO 744 720 744 744 720 74 Hours that each motor runs during the period (see Notes 3 & 4)	each motor runs during the market market market motor runs during the market motor runs during st that each motor runs during st that each motor runs during market mark	each motor runs during the mater runs during the mater runs during the mater runs during the mater runs during restricted by the seach motor runs during runs during restricted by the seach motor runs during restricted by the seach motor runs during restricted by the seach motor run	each motor runs during the mark and statements and	each motor runs during the m May Jun Jul 315 310 325 429 410 419 744 720 744 May Jun Jul May Jun Jul May Jun Jul St hat each motor runs during	each motor runs during the mark and statements and statements and statements and statements are statements. Statements and statements are statements are statements and statements are statements and statements are statements are statements and statements are statements are sta	each motor runs during the mark and state and motor runs during the mark and state and	each motor runs during the match motor runs during the match motor runs during the match motor runs during state each motor runs during may Jun Jul May	each motor runs during the match motor runs during the match motor runs during the match motor runs during sthat each motor runs during may Jun Jul May May Jul May Jul May May Jul May May Jul May May Jul May	each motor runs during the marker and motor runs during the marker and motor runs during state ach motor runs during may Jun Jul May May Jul M	each motor runs during the match motor runs during the match motor runs during the match motor runs during st that each motor runs during st that each motor runs during may Jun Jul May Jul M
		Hours that each moto		Hours that each moto Mar Apr May 300 310 315	Mar 300	Mar 300 300 744 744	Mar 300 744 744	Hours Ap 300 3 300 3 300 3 300 3 300 3 300 3 300 3 300 3 300 300 3 300	Mar Ap 300 3 3 444 4 4 7 7 744 7 7	Mar Ap 300 3 3 444 4 4 7 744 7 7	Mar Ap 300 3 300 3 300 Mar Ap Ap Ap Ap	Mar Ap 7744 7	Mar Ap 744 7 7 744 7 7 744 Ap 60 60 60 60	Mar Ap 744 7 744 7 744 7 7 744 7 7 744 7	Mar Ap 330 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Hours Ap 300 3 300	Hours 300 3 300 3 300 3 300 3 300 3 300 3 300 3 300 3 300 3 300 3 300	Mar Ap 744 7 744 7 744 7 744 4 4 7 744 4 7 744 7 7 744 7 7 744 7	Mar Ap 744 7 744 7 744 7 7 744 7 7 744 7
Information yor BHP motor HP	Information yor BHP	Information yor BHP motor HP	9	Peb M	M Reb	Feb IV	672 672 672	Feb NV 672 672	Feb N 672	Feb IV	672 N Feb N	Feb Ma 672 7 672 7 672 7 672 7 672 7 672 7 672 7 673 7 7 673	Feb Ma 672 7 7 4 4 672 7 7 672 7 7 672 7 7 672 7 7 672 7 7 7 7	Feb Ma 672 7 672 7 672 7 672 7 672 7 672 7 673 7	Feb Ma 672 7 672 7 672 7 672 7 672 7 672 7 672 7 673 8	Feb Ma 672 7 672 7 7 672 7 7	Feb Ma 672 7 672 7 7	Feb Ma 672 7 7 672 7 7 672 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Feb Ma 672 7 672 7 672 7 672 7 672 7 672 7 672 7 673 8
100 HP conve 1 1 85.0 1 100.0	ment and Motor Info	100 HP conveyor	without VFD The year (see last) Without VFD The year (see last) Where 2 & 31 18	without VFD To Hours that sale each motor ir runs during the year (see notes 2 & 3) To Hours 2 & 3) To Hours 1 And 1	without VFD	100 HP conveyor 100 HP conveyor 1	100 HP conveyor 100 HP conveyor 1	without VFD To He conveyor 100 HP conveyor 100 HP conveyor 100 BHP Without VFD The year (see and motor and and motor and	without VFD In Hours that In Notes 2 & 3) In Hours that	without VFD In Hours that In Notes 2 & 3) In Hours that I	without VFD r Hours that ach motor in runs during 8,760 s 8,760 s 8,760 s 8,760 s 10 cach motor in runs during runs during ach motor in runs during size ach motor in runs during runs du	without VFD In Hours that runs during s 8,760 s 8,760 s 8,760 s 8,760 s 8,760 s 8,760 s 100 s 7,60 s 100 s	100 HP conveyor 100 HP conveyor 1	100 HP conveyor 100 HP conveyor 1	100 HP conveyor 100 HP conveyor 1	100 HP conveyor 100 HP con	100 HP conveyor 100 HP con	100 HP conveyor 100 HP conveyor 1	100 HP conveyor 100 HP con
dition (see Note 1)	<u> </u>		X ral	Wir in 10	N	S 000 000 000 000 000 000 000 000 000 0	N	M	N	N	N	X	N	S S S S S S S S S S S S S S S S S S S	N	S S S S S S S S S S S S S S S S S S S	F S S S S S S S S S S S S S S S S S S S	S s s s s s s s s s s s s s s s s s s s	N S S S S S S S S S
Nameplate HP of Driven Equipment Motor	quipment Motor	quipment Motor	CONDITION OPE TWO WAS AS A CONTROL OUTDUT HP MOTO B % OF Efficien Motor @ Moto Nameplate Output HP (%)	CONDITION OPE CONDITION OPE output HP Moto as % of Efficien Motor @ Mot Nameplate Output HP (%) 85% 94.5	CONDITION OPE TWO COT OUT OUT OUT OUT OUT OUT OUT OUT OUT O	CONDITION OPE TWO COURTS OF THE COURTS OF T	ONDITION OPE SONDITION OPE as % of Efficient Motor @ Mo Nameplate Output HP (%) NAMED OPERATIO	CONDITION OPE CONDITION OPE Output HP Motor BS% of Efficier Motor @ Motor HP (%) NAMEDIAL (%)	aujoment Motor CONDITION OPE Output HP Moto as % of G Motor Nameplate Output HP (%) 0% NA 0% N	CONDITION OPE CONDITION OPE Output HP Notor Nameplate OW NA OW NA OW NA OW OW OW OUTPUT	CONDITION OPE THE CONDITION OPE Output HP (%) Nameplate (%) NA (%) Output HP (%) Output HP (%) NA (A) Output HP (%) NA (A) Output HP (%) NA (A) Output HP (%)	CONDITION OPE WOOD SEE ON PRICE WOOD Nameplate (%) REMINION NAMEDIA (%) NAME	CONDITION OPE TWO OUT HP SED OPERATIO OUT OUT HP OUT OUT OUT OUT HP OUT OUT HP OUT OUT HP OUT OUT HP NOTO OUT OUT HP SESSO 94.5 OUT OUT HP HP SESSO 94.5 OUT OUT HP SESSO 94.5 OUT OUT HP SESSO 94.5 OUT OUT HP HP SESSO 94.5 OUT OUT OUT OUT OUT HP SESSO 94.5 OUT OUT OUT OUT OUT HP SESSO 94.5 OUT	Output HP Motor as % of PEficier Motor (%) NA MOTOR (%) N	CONDITION OPE as % of Efficier Motor (@ Motor () (%) PASED OPERATIO DSED OPERATIO Output HP (%) NA () (%	CONDITION OPE	CONDITION OPE	CONDITION OPE	CONDITION OPE
	SECTION 2 - BASE CONDITION OPERATION without	ION 2 - BASE CON	## Company of Priver Priver	% of Driven output as bHP @ Actual Nam Cquipment (BHP)	ON 2 - BASE CON	## Soft Driven Output Soft Driven Output Soft Driven Output Soft Output	SECTION 2 - BASE CONDITION OPERATION will % of Driven bHP Driven output HP Motor Bquipment as % of Efficiency of Driven Load Nameplate Output HP Draw Gquipment (BHP) Motor @ Motor Power Draw (RMP) Motor Power Power Power Power Power (BHP) Motor Power (BHP) Motor Power P	of Driven outs Load Equipment as HP @ Actual M Inven Load Nam ment (BHP) % 0.0 % 85.0 0.0 white 0.0 white	% of Driven outh PHP @ Actual Mam quipment (BHP) and quipment (BHP) and quipment (BHP) and as a series of Full Driven outh Load Equipment as beload Equipment as Load Equipment as Load and prices of Load Equipment as Load and Requipment as Robert Research Control of Load Equipment as Robert Rober	f Driven outh outh outh outh outh outh outh outh	f Driven outh as been Load Nam	f Driven outh as been Load Nament (BHP) Nament (B	Columbia Columbia	DN 2 - BASE CON ad Equipment as Briven Out Con Out	No. 2 - BASE CON Driven outs Driven outs Driven outs Barrol outs Driven outs Barrol outs Driven	ad Equipment as Bactual Men Load Nam BE.0 No.0 Nam	ad Equipment as BS:0	ad Equipment as @ Actual Mam	Section 2 - BASE CON Section Name Section Name Section Name Section Name Section Name Section Sectio

A B C D E F G	I	-	_	×	_	Σ	z	0	Ь	Q	~	S	⊢	⊃
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA	۷.													
2 VARIABLE FREQUENCY DRIVE (VFD)			NOTE:	all info	rmatior	n per th	e "201	1-12-13	Revise	d Part	NOTE: all information per the "2011-12-13 Revised Part 2.pdf" file	ile		
4 SECTION 1 - GENERAL INFORMATION														
6 Applicant name Valley Asphalt Corp.												<u> </u>	App No. 11-423	1-423
7 Facility name Kilby Road, Cleves, Ohio													Rev.	0
44 ACTES.														
46 1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD	e driven equi	pment o	perates fo	r the base	condition	(i.e., witho	ut the VF							
4/ 2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., depending the year le.g.,	ear, till in Colu column H bla	mn H on nk and fi	ly; ir tne % ll in Colun	olumn H only; IT the % operating lo blank and fill in Columns I through	g loads var gh ⁻	y during tr	ie year (e.	g., depend	<u>⊆</u>					
w.		e energy	savings w	ill be calcu	lated by m	ultiplying	the saving	g per moto	r by the q	antity lis	The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1	on 1		
4.		the total	hours for	for the total hours for that month:	.H:									
51 * 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec 52 * 672 for Feb														
154 If the motor runs only a percentage of the time, use a value proportional to these values	oportional to	these va	lues											
	SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION	- BAS	E CONE	NOILI	DEMAN	D AND	CONSU	MPTIO	z					
58							Ener	Energy Demand (kw)	d (kw)					
59		Jan	Feb	Mar	Apr	May	Jun	lut	Aug	Sep	Oct	Nov	Dec	Annual
09	100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
61	Other													0.0
62	Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
63	•													
64							Ener	Energy Usage (kw-hr)	kw-hr)					
9		Jan	Feb	Mar	Apr	May	Jun	Inf	Aug	Sep	Oct	Nov	Dec	Annual
99	100%	0	0	0	0	0	0	0	0	0	0	0	0	0
29	Other	0	0	20,130	20,801	21,137	20,801	21,808	26,840	22,814	21,472	21,472	0	197,276
89	Total	0	0	20,130	20,801	21,137	20,801	21,808	26,840	22,814	21,472	21,472	0	197,276
69														

A B C	Ш	Ξ 5	_	_	×	_	Σ	z	0	Ь	ď	~	S	—	n
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA 2 VARIABLE FREQUENCY DRIVE (VFD)	ATIONS - IN IVE (VFD)	IPUT DATA		VOTE:	all info	rmation	per th	e "201.	NOTE: all information per the "2011-12-13 Revised Part 2.pdf" file	Revise	d Part 2	pdf" fi	le Ie		
4 SECTION 1 - GENERAL INFORMATION	RMATION														
Applicant name	halt Corp.														11-423
Facility name	Kilby Road, Cleves, Ohio			200			0	Ì						Rev.	0
70		SECTION 5		OSED	- PROPOSED DEMAND AND CONSUMPTION	ND AND	CONS	JMPTI	N N						
72								Ener	Energy Demand (kw)	d (kw)					
73		% of Full Load Capacity of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	Inf	Aug	Sep	Oct	Nov	Dec	Annual
74		100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75		%06	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
76		%08	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	0.0	53.7
77		%02	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0.0	47.0
78		%09	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	0.0	40.5
6/		20%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	0.0	33.9
80		40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	0:0	27.3
83		30%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	0.0	13.8
83		10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	0.0	6.9
84		Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
85															
98		% of Full Load Capacity						Ener	Energy Usage (kw-hr)	kw-hr)					
87		of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	In I	Aug	Sep	Oct	Nov	Dec	Annual
88		100%	0	0	0	0	0	0	0	0	0	0	0	0	0
68		%06	0	0	3,623	3,623	3,925	3,925	4,227	4,529	4,831	4,227	3,623	0	36,536
06		%08	0	0	3,221	2,952	2,952	2,952	3,489	3,489	4,026	3,489	2,952	0	29,524
91		%02	0	0	2,349	2,349	2,583	2,114	2,583	2,818	3,053	2,818	2,349	0	23,015
92		%09	0	0	2,024	2,024	1,821	1,619	1,619	2,226	2,226	2,024	2,024	0	17,606
93		20%	0	0	1,356	1,526	1,187	1,356	1,526	1,526	1,526	1,356	1,526	0	12,885
94		40%	0	0	955	818	818	818	955	818	1,091	955	1,091	0	8,318
95		30%	0	0	617	514	514	514	617	411	617	514	617	0	4,936
96		20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481
97		10%	0	0	0	0	0	0		0	0	0	0	0	0
86		Total	0	0	14,420	14,082	14,077	13,575	15,292	16,094	17,646	15,659	14,458	0	135,303
100 100		SECTION 6 - SAVINGS	- SAVI	NGS											
102			Jan	Feb	Mar	Apr	May	Jun	Int	Aug	Sep	Oct	Nov	Dec	Annual
103		Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
104		Energy Use (kw-hr)	0	0	5,710	6,719	7,059	7,226	6,516	10,746	5,168	5,813	7,015	0	61,972

⊃	.1.423 0		Yearly Total (hr)	3,080	0 20	2,620	8,900						Yearly Total (hr)	0	099	500	375	255	210	215	180	2,965	5,795
—	App No. 11-423 Rev. 0		γ		777	144	/44						<u></u> ∧									0	744
S		-	Nov	300	007	700	90						Nov		70	09	40	35	35	25	20	325	395
~			Oct	350	VCV	474	4//			;	3 & 4)		Oct		06	09	45	25	25	20	20	365	379
ď		otes 3 & 4)	Sep	400	Uoc	200	08/				d (see Notes		Sep	-	85	09	20	30	25	30	20	370	350
۵		onth (see N	Aug	450	VVC	204	/94				tne perior		Aug		85	09	20	30	25	20	20	370	374
0		Hours that each motor runs during the month (see Notes 3 & 4)	Ιη	320	410	419	/39				Hours that each motor runs during the period (see Notes 3 & 4)		In T		70	20	40	25	20	30	20	335	409
z	Per "2011-12-13 Revised Part 2.pdf"	r runs dur	nn	325	710	4 to	735				motor ru		Jun		80	09	30	20	20	20	20	320	400
Σ	ed Part	ach moto	Мау	320	000	429	/49				tnat each		Мау		09	20	40	30	20	30	20	310	434
_	3 Revis	urs that e	Apr	315	710	4 to	772				Hours		Apr	-	09	20	40	30	20	20	20	290	430
×	[1-12-1	욱-	Mar	300	VVV	1444	/44						Mar		90	20 4	40	30	20	20	20	280	464 744
_	er "203"		Feb		673	2/0	7/9						Feb							1		0	672
_	Information yor Motor HP Motor HP		Jan		744	744	/44						Jan									0	744
I	otor onve	4044	Hours that each motor runs during the year (see		0 760	0,700	8,760			Hours that	each motor	runs during the year	(Notes 2 & 3)										0
g	UT DAT	Motor	=	67.10	#DIV/0!	0.00	lotals	th VFD				Electrical r Power	Draw (kw)	67.10	60.39	46.97	40.47	33.91	27.27	20.57	13.78	NA AN	NA Totals
ш	- INP ION On (see N			% 3	% %	4		N Wi	%	ŀ			t H (%		_	_			_	% %	%	
ш	E (VFI	Motor	⊕ Q	94.5		AN		RATIC	97		Motor	Efficiency @ Motor	Output HP (%)	94.5	94.5	94.5	94.0	93.5	93.0	92.5	92.0	ΝΑ	NA
Q	AL INFORMATION AL INFORMATION Valley Asphalt Corp. 7940 Main St, Newtown, Ohio ECM-2: VFD for Main Street Location Driven Equipmen A Operating Condition (see Note 1) juipment Motor ONDITION OPERATION with	Output HP	as % of Motor Nameplate HP	85%	%0 %	900		ED OPE		MOTOL	output HP	as % of Motor	Nameplate HP	85%	77%	%09	51%	43%	34%	79%	17%	NA	NA
U	FREQUEN - GENERA - GENERA - Hification Tification Jipment G Full Load of Driven Equ	Driven	t <u>-</u>	85.0	0.0	0.0		- PROPOS	٥	0.419		Equipment @ Actual	Load N (BHP)	85.0	76.5	59.5	51.0	42.5	34.0	25.5	17.0	NA	AN
A	ENERGY SAVINGS CALCULATIONS - INPUT DATA VARIABLE FREQUENCY DRIVE (VFD) SECTION 1 - GENERAL INFORMATION Applicant name Valley Asphalt Corp. Facility name 7940 Main St, Newtown, Ohio ECM ECM ECM-2: VFD for Main Street Location ECM Driven Equipment and Miles and Miles of Echipment (See Note 1) 100 HP of Quantity of Equipment Brake HP (BHP) @ Full Load Operating Condition (see Note 1) 85.0 Nameplate HP of Driven Equipment Motor 100.0	yo %	, , ,	100 %	% 55	Not Kunning		SECTION 3 - PROPOSED OPERATION with VFD	Efficiency of VFD		% of Full	Load Eapacity of	Driven Equipment	100 %	-	+	-	20 %	-	\rightarrow	20 %	=	Not Running
	, , , , , , , , , , , , , , , , , , , 	18	19	20	7.7	77	24 24	25	-	87	67		30	31	32	34	35	36	37	38	39	41	42

A B C D	В	P.	Ξ	_	ſ	×	٦	Σ	z	0	Ь	Q	~	S	⊢)
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA	JLATIONS -	INPUT [DATA													
VARIABLE FREQUENCY DRIVE (VFD)	ORIVE (VFD)				Per "2	011-12	Per "2011-12-13 Revised Part 2.pdf"	ised Paı	rt 2.pdf							
SECTION 1 - GENERAL INFORMATION	FORMATIC	Z														
		:												'		
ne	Valley Asphalt Corp.														App No. 11-423	11-423
7 Facility name 7940 N	7940 Main St, Newtown, Ohio	ın, Ohio													Rev.	0
44																
45 NOTES:																
1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD	ion is the condi	tion at whi	ich the driven ec	quipment o	perates fo	or the base	condition	(i.e., with	out the VF							
47 2. If the % operating loads are the same for each month of the year, fill in Column H only; if the % operating loads vary during the year (e.g., depending the year).	same tor each	month of t	he year, till in C	olumn H o	nly; if the	% operatin	ig loads var	y during tl	he year (e.	g., depend	u.					
on weather conditions or other season conditions), then leave column H	season condition	ons), tnen i	eave column H	DIAINK AND		Blank and IIII In Columns I through	ugn I- + - I	1 1 1 1	1	-	14					
49 3. Input values are to be entered for <u>ONE</u> driven equipment and its motor. 50 4. If the motor runs continuously during a month use the following values	ror <u>ONE</u> ariven (during a month	equipment	and its motor. Illowing values f	Ine energy	/ savings w Il hours fo	The energy savings will be calculated the total hours for that month:	Ine energy savings will be calculated by multiplying the saving per motor by the quantity listed in section 1 for the total hours for that month:	nuitipiying	tne saving	g per moto	ır by tne q	uantity lisi	ed in secti	on 1		
51 * 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec	ug, Oct, & Dec) ; ;	0													
52 * 672 for Feb																
1f the motor runs only a percentage of the time, use a value proportional to these values	itage of the tim	e, use a val	lue proportional	to these v	alues											
55																
56			SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION	4 - BAS	E CON	OITION	DEMAN	ID AND	CONSL	MPTIC	Z					
57																
58									Ener	Energy Demand (kw)	id (kw)					
59				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
09			100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
61			Other													0.0
62			Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
63																
64									Ener	Energy Usage (kw-hr)	(kw-hr)					
65				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
99			100%		0	0 0	0	0	0	0	0	0	0	0	0	0
67			Other		0	0 20,130	21,137	21,472	21,808	21,472	30,195	26,840	23,485	20,130	0	206,670
68			Total		0	0 20,130	21,137	21,472	21,808	21,472	30,195	26,840	23,485	20,130	0	206,670
69																

	-	-	-	>	-	2	2	C		(·	ŀ	=
7		-	7	∠	_	2	2	>	_	3	_	ი	-	0
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA	INPUT DATA													
2 VARIABLE FREQUENCY DRIVE (VFD)		4	er "20	11-12-	13 Revi	sed Paı	Per "2011-12-13 Revised Part 2.pdf"	=						
SECTION 1 - GENERAL INFORMATION	Z]													
5 Applicant name Valley Asphalt Corp.													App No. 11-423	1-423
7 Facility name 7940 Main St, Newtown, Ohio													Rev.	0
70	SECTION 5	5 - PROP	OSED	DEMAL	ND AND	CONS	- PROPOSED DEMAND AND CONSUMPTION	N N						
72							Ener	Energy Demand (kw)	d (kw)					
73	% of Full Load Capacity of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	ΙΝ	Aug	Sep	Oct	Nov	Dec	Annual
74	100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	%06	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
92	%08	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	0.0	53.7
77	%02	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0.0	47.0
78	%09	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	0.0	40.5
79	20%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	0.0	33.9
80	40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	0.0	27.3
81	30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	0.0	20.6
82	20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	0.0	13.8
83	10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	0.0	6.9
84	Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
85														
98	% of Full Load Capacity						Energ	Energy Usage (kw-hr)	kw-hr)					
87	of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	 	Aug	Sep	Oct	Nov	Dec	Annual
88	100%	0	0	0	0	0	0	0	0	0	0	0	0	0
88	%06	0	0	3,623	3,623	3,623	4,831	4,227	5,133	5,133	5,435	4,227	0	39,858
06	%08	0	0	2,147	2,684	3,221	3,758	4,294	4,294	3,758	4,294	2,147	0	30,598
91	%02	0	0	2,349	2,349	2,349	2,818	2,349	2,818	2,818	2,818	2,818	0	23,485
92	%09	0	0	1,619	1,619	1,619	1,214	1,619	2,024	2,024	1,821	1,619	0	15,178
93	20%	0	0	1,017	1,017	1,017	678	848	1,017	1,017	848	1,187	0	8,647
94	40%	0	0	545	545	545	545	545	682	682	682	955	0	5,727
95	30%	0	0	411	411	617	411	617	411	617	411	514	0	4,422
96	20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481
97	10%	0	0	0	0	0	0	0	0	0	0	0	0	0
86	Total	0	0	11,988	12,525	13,267	14,532	14,775	16,656	16,325	16,586	13,743	0	130,396
100	SECTION 6 - SAVINGS	5 - SAVIN	IGS											
101		\$	407	700	744	Max	-	3	V.:.	800	ţ	2012	30	Ichary
103	Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	50.4	60.4	60.4	0.0	60.4
104	Energy Lise (kw-hr)	9 0	0.0	8 142	8 612	8 205	7 276	6 697	13 540	10.516	6 899	6 387	2.0	76 274
100	Liiciby Osc (var iii)	>	2	1,1,0	112,0	, ,	7,1(,	,,,,	1 2 2	10,01	2,0	, , ,	>	

=	0		Yearly Total (hr)	3,150	5,820	8,970			Yearly Total	0	635	465	390	345	260	180	0	3,075	100
-	App No. 11-423		Ye		744	744			Ye	3								0	700
<i>y</i>	1			300	400	200					70	45	45	40	30	20	2	340	000
	<u></u>		Ž							-	75	55	40	45	25	20	2		ļ
~	_	,	0	350	424	774		tes 3 & 4)	i to	3								355	L
С			Notes 3 & Sep	375	380	755		od (see No	S	25	80	55	45	40	30	20	91	365	C
۵	_	·	onth (see	200	344	844		the peri		Snv	75	55	45	40	35	20	2	360	. 00
С		=	ing the m	340	419	759		ns during	<u> </u>	D.	80	55	40	35	35	20	2	355	000
z	2.pdf"		runs dur Jun	310	410	720		motor ru	<u> </u>	IDC I	75	55	45	35	35	20		355	100
Σ	Per "2011-12-13 Revised Part 2.pdf"		Hours that each motor runs during the month (see Notes 3 & 4) Apr May Jun Jul Aug Sep	330	429	759		Hours that each motor runs during the period (see Notes 3 & 4)	2	IVIGY	09	50	45	35	25	20	2	325	
	Revise	-	Irs that ea	325	410	735		Hours t			09	50	45	35	25	20	2	315	
	12-13			320	444	764				-	09	45	40	40	20	20	2	305	
_	2011-		Mar						2	_		-			+			0	
_	Per "		Feb		672	672			3	Co.									ļ
-	-	Motor HP	Jan		744	744			<u>\$</u>	Jan								0	
I		100 HP conveyor 1 85.0 BH 100.0 mo	Hours that each motor runs during the year (see Notes 2 & 3)		8,760	8,760		Hours that	runs during the year (Notes 2 &	5									İ
	r DAT,	N with		67.10 #DIV/0!	0.00	Totals		_	Motor es Electrical ru Power (67.10	60.39	46.97	40.47	33.91	27.27	13.78	6.93	NA	
Ц	INPUT	See Note	E B S C C	% % #D#	+		N with			%					% %				1
ш	(VFD)	OPER	= c = -	94.5	AN		ATION 97		Motor Efficiency @ Motor Output HP			_	_		93.0	_	_	NA	t
	AL INFORMATION Valley Asphalt Corp. Solid Industrial Dr. Location ECM-3: VFD for Industrial Dr. Location	nt Moto		85%			OPER/	10.		85%						17%			
	CALCL NCY E RAL IN Valley 309 Inc ECM-3	nd Operati quipment	o S				OSED (INIOTOL	output HP as % of Motor Nameplate									NA	
C		Equipment Identification Quantity of Equipment Brake HP (BHP) @ Full Load Operating Condition (see Note 1) 85.0 Nameplate HP of Driven Equipment Motor SECTION 2 - BASE CONDITION OPERATION without	Driven Equipment @ Actual Load (BHP)	85.0	0.0		SECTION 3 - PROPOSED OPERATION with VFD Efficiency of VFD	DILL DI	Driven Equipment @ Actual Load	85.0	76.5	59.5	51.0	42.5	34.0	17.0	8.5	NA	
В	ENERGY SA' VARIABLE F SECTION 1 - Applicant name Facility name ECM	Equipment Identification Quantity of Equipment Quantity of Equipment Brake HP (BHP) @ Full I Nameplate HP of Driver SECTION 2 - BASI		% %	ning		SECTION 3 -			%	\bot	+	+	\vdash	% %	+-	+	nning	+
٨	ENERGY S VARIABLE SECTION : Applicant name Facility name ECM		% of Full Load bHP of Driven Equipment	100	Not Running				% of Full Load Capacity of Driven	100	06	200	09	20	40	20 20	10	Total Running	
	1 2 8 4 9 7 8 6	11 12 13 14 15 16 17	18	20	22	23	24 25 26 27 28	29		31	32	34	35	36	37	39	40	41	ç

A B C D E F G	I	-	_	×	7	Σ	z	0	Ь	Ø	æ	S	⊢	D
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA			_											
2 VARIABLE FREQUENCY DRIVE (VFD)			Per "2	011-12	Per "2011-12-13 Revised Part 2.pdf"	sed Pai	t 2.pdf							
2 SECTION 1 - GENERAL INFORMATION														
												L	;	
b Applicant name Valley Asphalt Corp. 7 Facility name 309 Industrial Dr. Franklin Ohio												<u> </u>	App No. 11-423 Rev. 0	1-423
												J		
45 NOTES:														
46 1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD 47 2 If the % operating loads are the same for each month of the year fill in Column Honly: if the % operating loads are the same for each month of the year fill in Column Honly: if the % operating loads are the same for each month of the year fill in Column Honly: if the % operating loads are the same for each month of the year fill in Column Honly: if the % operating loads are the same for each month of the year.	driven equip	pment o	perates fo	r the base	condition gloads var	(i.e., witho	out the VF	D deneng	Ë					
on weather conditions or other season conditions), then leave column H	olumn H blaı	nk and fi	II in Colun	blank and fill in Columns I through	gh -	0		2000						
49 3. Input values are to be entered for ONE driven equipment and its motor.		e energy	savings w	ill be calcu	The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1	ultiplying	the saving	g per moto	r by the q	uantity lis	ted in Sect	ion 1		
4.		the total	hours for	for the total hours for that month:	th:									
51 * 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec														
	portional to	these va	lues											
	i de	6		Ċ		2		H	3					
50	SECTION 4 - BASE CONDITION DEIMAND AND CONSOINFILON	- DAS			DEINIAIN	D AND	CONSC	7 N	<u> </u>					
58							Ener	Energy Demand (kw)	id (kw)					
59		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
09	100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
61	Other													0.0
62 N	Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
64							Ener	Energy Usage (kw-hr)	kw-hr)					
9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
99	100%	0	0	0	0	0	0	0	0	0	0	0	0	0
29	Other	0	0	21,472	21,808	22,143	20,801	22,814	33,550	25,163	23,485	20,130	0	211,367
89	Total	0	0	21,472	21,808	22,143	20,801	22,814	33,550	25,163	23,485	20,130	0	211,367
69														

	(-	-	2	-	-	2	(٥	(ŀ	=
7	ב ס	-	,	_	_	Δ	2)	_	3	_	n	-	>
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA	- INPUT DATA													
2 VARIABLE FREQUENCY DRIVE (VFD)	<u>۵</u>	4	er "20	11-12-	13 Revi	sed Paı	Per "2011-12-13 Revised Part 2.pdf"	=						
4 SECTION 1 - GENERAL INFORMATION	NOI													
5 Applicant name Valley Asphalt Corp.													App No. 11-423	1-423
7 Facility name 309 Industrial Dr, Franklin Ohio													Rev.	0
70	SECTION 5	5 - PROP	OSED	DEMAN	ND AND	CONSI	- PROPOSED DEMAND AND CONSUMPTION	N						
72							Ener	Energy Demand (kw)	d (kw)					
73	% of Full Load Capacity of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	耳	Aug	Sep	Oct	Nov	Dec	Annual
74	100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	%06	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
92	%08	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	0.0	53.7
77	%02	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0.0	47.0
78	%09	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	0.0	40.5
79	20%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	0.0	33.9
80	40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	0.0	27.3
81	30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	0.0	20.6
82	20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	0.0	13.8
83	10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	0.0	6.9
84	Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
85														
98	% of Full Load Capacity						Ener	Energy Usage (kw-hr)	(w-hr					
87	of Driven Equipment	Jan	Feb	Mar	Apr	May	lun	Inc	Aug	Sep	Oct	Nov	Dec	Annual
88	100%	0	0	0	0	0	0	0	0	0	0	0	0	0
68	%06	0	0	3,623	3,623	3,623	4,529	4,831	4,529	4,831	4,529	4,227	0	38,348
06	80%	0	0	3,221	3,221	3,489	3,221	3,221	3,489	3,758	3,489	3,221	0	30,329
91	%02	0	0	2,114	2,349	2,349	2,583	2,583	2,583	2,583	2,583	2,114	0	21,841
92	%09	0	0	1,619	1,821	1,821	1,821	1,619	1,821	1,821	1,619	1,821	0	15,785
93	20%	0	0	1,356	1,187	1,187	1,187	1,187	1,356	1,356	1,526	1,356	0	11,699
94	40%	0	0	545	682	682	955	955	955	818	682	818	0	7,091
95	30%	0	0	411	411	514	617	617	514	514	617	617	0	4,833
96	20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481
97	10%	0	0	0	0	0	0	0	0	0	0	0	0	0
86	Total	0	0	13,166	13,570	13,941	15,189	15,288	15,524	15,958	15,321	14,450	0	132,407
100	SECTION 6 - SAVINGS	5 - SAVIN	IGS											
101				•		•								
102		Jan	Feb	Mar	Apr	May	Jun	Int	Aug	Sep	Oct	Nov	Dec	Annual
103	Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
104	Energy Use (kw-hr)	0	0	8,306	8,238	8,202	5,612	7,526	18,026	9,205	8,164	2,680	0	78,959

D	1423		Yearly Total (hr)	2,875	5.820	8,695						Yearly Total	(hr)	595	515	470	400	325	200	180	0	2,935	8,760
-	App No. 11-423 Rev. 0		, Dec	1	744	744						>	Dec								C	0 0	744
S	1 -		Nov	300	400	700							Nov	09	55	50	20	30	20	20	CCC	330	720
~			Oct	320	424	744				18384)			Oct	75	65	55	50	30	25	20	030	360	744
Q		Notes 3 & 4)	Sep	325	380	705				od (see Note			Sep	70	65	09	50	35	25	20	0110	370	720
۵		Hours that each motor runs during the month (see Notes 3 & 4)	Aug	360	344	704				Hours that each motor runs during the period (see Notes 3 & 4)			Aug	75	65	55	45	30	25	20	77.	355	744
0		ring the m	Jul	320	419	739				uns during			Inf	65	09	55	40	30	20	20	7,00	325	744
z	t 2.pdf	or runs du	Jun	325	410	735				h motor r			Jun	09	50	50	45	30	25	20	700	305	720
Σ	Per "2011-12-13 Revised Part 2.pdf"	each mot	Мау	315	429	744				s that eac			May	65	55	50	40	30	20	20	700	305	744
_	13 Revi	ours that	Apr	310	410	720				Hour			Apr	65	50	45	40	30	20	20	100	767	720
×	11-12-		Mar	300	444	744							Mar	09	50	50	40	30	20	20	COC	757	744
_	Per "2C		Feb		672	672							Feb								c	0	672
_	Informatic		Jan		744	744							Jan								c	0 244	744
I	otor of the state	Hours that each motor	runs during the year (see Notes 2 & 3)		8.760	8,760				nours that	runs during	the year (Notes 2 &	3)										0
ŋ	PUT DA	Motor	Power Draw (kw)	67.10	#DIV/0:	Totals	ith VFD			20+040	Electrical	Power Draw	(kw)	67.10	53.68	46.97	40.47	33.91	20.57	13.78	6.93	¥ ≥	Totals
ш	S - INI FD) FION Innoe Ol rver Rd Ion (see		<u> </u>	% %	+		NO NO	%	2	20+0		@ Motor Output HP	_	% %	\perp	_	_	% %	_	-	_	% %	
Ш	TION!			6 94.5	NA N		ERATI		2				•	6 94.5				93.5				¥ 2	147
Ω	AL INFORMATION AL INFORMATION Valley Asphalt Corp. 581 Garver Rd, Monroe Ohio ECM-4: VFD for Garver Rd Location Driven Equipme d Operating Condition (see Note 1) quipment Motor CONDITION OPERATION w	output HP as % of	Motor Nameplate HP	85%	%0		SED OPE			INIOTOT	as % of	Motor Nameplate	윤	85%	%89	%09	51%	34%	79%	17%	%6	AN S	7
U	FREQUEN - GENERA - GE	Driven		85.0	0.0		- PROPO	<u>:</u>		Duition	Equipment	@ Actual Load	(BHP)	85.0	68.0	59.5	51.0	34.0	25.5	17.0	8.5	₹ Z	ر <u>۱</u>
A	ENERGY SAVINGS CALCULATIONS - INPUT DATA VARIABLE FREQUENCY DRIVE (VFD) SECTION 1 - GENERAL INFORMATION Applicant name Valley Asphalt Corp. Facility name S81 Garver Rd, Monroe Ohio ECM ECM ECM-4: VFD for Garver Rd Location Driven Equipment and M Equipment Identification Quantity of Equipment Brake HP (BHP) @ Full Load Operating Condition (see Note 1) Nameplate HP of Driven Equipment Motor SECTION 2 - BASE CONDITION OPERATION without	p	נוס נוס	100 %	Not Running	0	SECTION 3 - PROPOSED OPERATION with VFD	Efficiency of VED		Jo /0	Load	Capacity of Driven	e	100 %	+	\rightarrow	-	% % % %	+	\vdash	10 %	Total Running	NOT KUMING
	, , , , , , , , , , , , , , , , , , , 	18	19	20	22	23			_	59			30	31	33	34	35	37	38	39	40	4T	43

Fire Fig. 2 April Carbon Continuence Valley Acquisit Carbon Continuence Valley Carbon Continuence Valley Carbon Continuence Valley Carbon Continuence	A B C D E F G	I	_	_	×	_	Σ	z	0	Ь	Ø	~	S	-	ם
Per "2011-12-13 Revised Part 2.pdf" quipment operates for the base condition (i.e., without the VFD column H only; if the % operating loads vary during the year (e.g., dependin Dehman H only; if the % operating loads vary during the saving per motor by the quantity listed in Section 1 for the total hours for that month: In the total hours for that month: 44 - BASE CONDITION DEMAND AND CONSUMPTION FINE THE PASE CONDITION DEMAND AND CONSUMPTION In to these values Jan Feb Mar Apr Lord Cot Nov Dec Annual Annual Annual Annual Annual Annual (kw) Annual	ENERGY SAVINGS CALCULATIONS - INPUT DAT														
App No. 11-423 Rev. App No. App No	VARIABLE FREQUENCY DRIVE (VFD)	:		Per "2(011-12-	.13 Revi	ised Pai	t 2.pdj	5						
App No. 111-423	SECTION 1 - GENERAL INFORMATION														
Applient anne Sti Gaver Rd, Monree Origin at which the driven equipment operates for the base condition (i.e., without the VFD 1. The "full load" operating condition is the condition of the year (i.e., without the VFD 2. If the work operating condition is the condition of the year (i.e., without the Year (i.e., depending) on weather conditions of the reach of year of the total hours for the motor runs continuously during amonth, use the following values for the total hours													_	-	
Section 1 1 1 2 2 2 2 3 3 3 3 3 3														App No.	11-423
quipment operates for the base condition (i.e., without the VFD blank and fill in Columns I through													_		
quipment operates for the base condition (i.e., without the VFD column H only; fithe % operating loads vary during the year (e.g., dependin blank and fill in Columns I through	NOTES:														
Laborating Column H only; if the % operating Column H only; if the column H only	1. The "full load" operating condition is the condition at which th	e driven equi	oment op	erates fo	r the base	condition	(i.e., with	out the VF	<u>_</u>						
Diank and fill in Columns through	2. If the % operating loads are the same for each month of the ye	ear, fill in Colu	mn H onl	y; if the %	operating	g loads var	y during tł	ne year (e	.g., depen	din					
The energy savings will be calculated by multiplying the saving per motor by the quantity listed in Section 1 for the total hours for that month: 4 - BASE CONDITION DEMAND AND CONSUMPTION A - BASE CONDITION DEMAND AND CONSUMPTION	on weather conditions or other season conditions), then leave		rk and fil	l in Colum	nns I throu	gh -									
1 to these values 1 to the value 1 to the v	3. Input values are to be entered for ONE driven equipment and i		energy	savings w	ill be calcu	llated by n	ultiplying	the savin	g per mot	or by the c	uantity lis	ted in Sect	ion 1		
SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION Sep Oct Nov Dec Annual Live Annual L	4. II the motor runs continuousiy during a month, use the rollowi * جماء فيم المتحدد	ng values ror	ine total	nours ror	tnat mon	:: ::									
SECTION 4 - BASE CONDITION DEMAND AND CONSUMPTION Aug Sep Oct Nov Dec Annua Other Ot	* 744 Ior Jan, Mar, May, Jul, Aug, Oct, & Dec * 672 for Feb														
SAME Apr May Jun Jul Aug Sep Oct Nov Dec Annua Annua Annua Anua Anaa Anua Anua Anua Anua Anua Anua Anua Anua Anaa Anua Anua Anua Anua Anua Anua Anua Anua Anaa	* 720 for Apr, Jun, Sep, & Nov														
kw) Aug Sep Oct Nov Dec Annua 67.1 67.1 67.1 67.1 67.0 6 67.1 67.1 67.1 67.1 6 6 67.1 67.1 67.1 6 6 6 6 67.1 67.1 67.1 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 7 7 6 7 7 7 6 7 <td>If the motor runs only a percentage of the time, use a value pr</td> <td>oportional to</td> <td>these va</td> <td>nes</td> <td></td>	If the motor runs only a percentage of the time, use a value pr	oportional to	these va	nes											
kw Aug Sep Oct Nov Dec Annua 67.1 67.1 67.1 0.0 6 67.1 67.1 67.1 0.0 6 67.1 67.1 67.1 0.0 6 -hr -hr															
Sep Oct Nov Dec Annua Aug Sep Oct Nov Dec Annua Sep Oct Solid	· S	ECTION 4	- BASI	COND	NOITION	DEMAN	D AND	CONSI	JMPTIC	짇					
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Annua Annua Anua Anua Anua Anua Anua Anua Aug Sep Oct Nov Dec Annua Anua		_													
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Annual 0.0 0.0 67.1								Enei	gy Demai	d (kw)					
0.0 0.0 67.1 67			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
0.0 67.1		100%	0.0	0.0		67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
Column C		Other													0.0
Energy Usage (kw-hr) Jan Feb Mar Apr Jun Jul Aug Sep Oct Nov Dec A 0		Maximum	0.0	0.0			67.1	67.1	67.1		67.1	67.1	67.1	0.0	67.1
Image Same S		ļ													
Jan Feb Mar Apr Jun Jul Aug Sep Oct Nov Dec A 0								Ener	gy Usage	(kw-hr)					
0 0			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
0 0 20,130 20,801 21,137 21,808 21,472 24,156 21,808 21,472 20,130 0 0 20,130 20,801 21,137 21,808 21,472 24,156 21,808 21,472 20,130 0		100%	0	0			0	0	0	0	0	0	0	0	0
0 0 20,130 20,801 21,137 21,808 21,472 24,156 21,808 21,472 20,130 0		Other	0	0			21,137	21,808		24,156	21,808	21,472	20,130	0	192,914
		Total	0	0			21,137	21,808	21,472		21,808	21,472	20,130	0	192,914

<	-		-	-	_	-	2	2	C		C		ú	F	=
Ť	ا م		-	5	∠	_	2	2	>	_	3	<u>-</u>	2	-	o
1 ENERGY SAVINGS	ENERGY SAVINGS CALCULATIONS - INPUT DATA	NPUT DATA													
2 VARIABLE FREQU	VARIABLE FREQUENCY DRIVE (VFD)		4	er "20	Per "2011-12-13 Revised Part 2.pdf"	3 Revis	ed Pari	t 2.pdf	=						
SECTION 1	- GENERAL INFORMATION	7													
6 Applicant name	Valley Asphalt Corp.													App No.	11-423
7 Facility name	581 Garver Rd, Monroe Ohio													Rev.	0
70		SECTION	5 - PROP	OSED I	- PROPOSED DEMAND AND CONSUMPTION	D AND	CONSU	MPTIC	Z						
72								Ener	Energy Demand (kw)	d (kw)					
73		% of Full Load Capacity of Driven Equipment	Jan	Feb	Mar	Apr	May	unr	luf	Aug	Sep	Oct	Nov	Dec	Annual
74		100%	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0	0:0	0.0	0:0	0:0	0.0
75		%06	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
92		%08	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	0.0	53.7
77		%02	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0.0	47.0
78		%09	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	0.0	40.5
79		20%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	0.0	33.9
80		40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	0.0	27.3
81		30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	0.0	20.6
82		20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	0.0	13.8
83		10%	0.0	0.0	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	0.0	6.9
84		Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
85															
98		% of Full Load Capacity						Energ	Energy Usage (kw-hr)	kw-hr)					
87		of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	lut	Aug	Sep	Oct	Nov	Dec	Annual
88		100%	0	0	0	0	0	0	0	0	0	0	0	0	0
68		%06		0	3,623	3,925	3,925	3,623	3,925	4,529	4,227	4,529	3,623	0	35,932
06		%08		0	2,684	2,684	2,952	2,684	3,221	3,489	3,489	3,489	2,952	0	27,645
91		%02		0	2,349	2,114	2,349	2,349	2,583	2,583	2,818	2,583	2,349	0	22,076
92		%09		0	1,619	1,619	1,619	1,821	1,619	1,821	2,024	2,024	2,024	0	16,190
93		20%		0	1,017	1,017	1,017	1,017	1,187	1,356	1,526	1,356	1,526	0	11,020
94		40%		0	545	682	682	682	818	818	955	818	818	0	6,818
95		30%		0	411	411	411	514	411	514	514	514	411	0	4,113
96		20%		0	276	276	276	276	276	276	276	276	276	0	2,481
97		10%	0	0	0	0	0	0	0	0	0	0	0	0	0
86		Total	0	0	12,525	12,728	13,231	12,966	14,041	15,388	15,829	15,590	13,979	0	126,277
99		SECTION 6	STAVINGS	SE											
101															
102			Jan	Feb	Mar	Apr	May	Jun	lnf	Aug	Sep	Oct	Nov	Dec	Annual
103		Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
104		Energy Use (kw-hr)	0	0	7,605	8,073	7,905	8,841	7,432	8,769	5,979	5,882	6,151	0	66,637

⊃		-423	0									Yearly Total	(hr)	2,796	5 820	0,020	0,010							Yearly Total	(hr)	0	680	395	315	260	200	1/0	0	2,770	5,990
–	-	App No. 11-423	Kev.									Ye	Dec		744	744	ţ							Ϋ́	Dec									0	744
S	_	Ā								-				286	400	686	9								Nov		65	40	30	25	30	20	07	290	430
	- -									-			Ž														75	40	30	25	20	70		L	L
~										4)			٥	286	424						10.000	res 5 & 4)			Oct									300	444
Q	,									Notes 3 &			Sep	286	380	999	8				old cost bo	on lsee No			Sep		90	40	35	30	30	20	0.4	340	380
Ь										onth (see			Aug	486	344	830	25				the neri	מווב אבוו			Aug		90 2	50	40	25	20	15	07	330	414
0										ing the m			Inf	286	419	705	3				odining	20 			Jul		80	40	30	25	20	15	07	300	444
z	2.pdf"									runs dur			Jun	297	410	707	2				n votom				Jun		85	40	30	30	20	70	07	320	400
Σ	ed Part									ach moto			May	286	429	715	677				that oach				May		65	45	40	40	20	20	04	300	444
_	Per "2011-12-13 Revised Part 2.pdf"									Hours that each motor runs during the month (see Notes 3 & 4)			Apr	286	410	696	86				Parion				Apr		70	50	40	30	20	20	04	300	420
~	1-12-13									- Hor			Mar	297	444	7.4.1	1								Mar		09 02	20	40	30	20	70	07	290	454
_	ır "201.									-			Feb	+	673	2/0	2/0								Feb									0	673
	Pe				mation			motor HP		-			Jan		744	744	ţ								Jan						+			0	744
	-				or Infor	- Acyon	BHP	mot	VFD	<u> </u>		<u>™</u> 8		_			2				7	į	8	- A			+	-			_	+	+	L	
I			uc		nt and Motor Info	1	85.0	100.0		,4+ 02.10 II	each motor	runs during	Notes 2 & 3)		8 760	00/00	0,10	_			поить тпат	each motor	runs during	(Notes 2 &	3)										
ŋ	UT DA:		Rd Location		Driven Equipment and Motor Information		lote 1)		ION wit	Motor	=	Power Draw		67.10	#DIV/0:	Totale	Cais	th VFD					_	Draw	(kw)	67.10	60.39	46.97	40.47	33.91	27.27	12.05/	6.93	NA	ΑN
ш	- ION		bs Mill		Oriven		n (see N		ERAT					% %	-	4		N Wi		%	ŀ				,		% %	_	_	%	_	% %	-	_	%
Ш	ONS E (VFI	t Corp.	or Stub		_		onditio	tor	N O PE	Motor	Efficiency	@ Motor Output HP	(%)	94.5	۷N	Į.		ATIC		97		Motor	Efficiency	Output HP	(%)	94.5	94.5	94.5	94.0	93.5	93.0	92.5	91.5	Ν	ΝA
۵	CULATI Y DRIVE	Valley Asphalt Corp.	4850 Stubbs Mill Rd, Morrow Unio ECM-5: VFD for Stubbs Mill Rd Location				oerating C	ment Mo	IDITIO	output HP	as % of	Motor Nameplate	_	85%	%0	0/0		D OPER			IVIOTOF	output HP	as % of	Nameplate	HP	85%	77%	%09	51%	43%	34%	7021	%6	ΝΑ	AN
L	GS CAL LUENC' NERAL	Val	ECN ECN		uci	1t	Load Or	en Equip	SE CON					85.0	0.0	0.0		JPOSE			ŀ					85.0	76.5	59.5	51.0	42.5	34.0	25.5	8.5		
S	AVIN FREC	Je			antificat	uipmei	P) @ Ful	of Driv	BA	Driven	Equipment	@ Actual Load	(внр)					3 - PR(Œ	ם שום	Driven	Equipment	(g. Actual	(BHP)									NA	NA
A B	RG)	Applicant name	Facility name		Farrinment Identification	Quantity of Equipment	Brake HP (BHP) @ Full Load Operating Condition (see Note 1)	Nameplate HP of Driven Equipment Motor	SECTION 2 - BASE CONDITION OPERATION without	% of	Full Load	bHP of Driven	Equipment	100 %	Not Busping	ot Kunning		SECTION 3 - PROPOSED OPERATION with VFD		Efficiency of VFD		% of Full	Load	Capacity or Driven	Equipment	-	% %	+	-	20 %	\rightarrow	30 %	+	Ē	Not Running
	N			T	10 11 Fa			14 Nan	1	18	ű.	ō		20	27 NG		24	25 SE (_	27 Effic	20		Ċ	<u>-</u> د	30 Eq	31	32	34	35	36	37	38	40	+	⊬

A B C D E F G	Ŧ	-	_	×	7	Σ	z	0	Ь	Q	8	S	-	ם
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA	_												_	
2 VARIABLE FREQUENCY DRIVE (VFD)			Per "2	011-12	Per "2011-12-13 Revised Part 2.pdf"	sed Pai	rt 2.pdf							
3 SECTION 1 - GENERAL INFORMATION														
5 Anniirant name Vallay Acubalt Corn												L	11 /72	773
Facility name												-	Rev.	0
												I		
43 NOLES: 46 1. The "full load" operating condition is the condition at which the driven equipment operates for the base condition (i.e., without the VFD	driven equip	pment o	perates fo	r the base	condition	(i.e., with	out the VF							
	r, fill in Colur	mn H or	ly; if the 9	6 operatin	g loads var	y during tl	he year (e.	g., depen	Jin					
on weather conditions or other season conditions), then leave column H		nk and f	II in Colun	blank and fill in Columns I through	lgh -	-		-	1			7		
 3. Input values are to be entered for UNE arriven equipment and its motor. 50 4. If the motor runs continuously during a month, use the following values 		e energy the tota	savings w hours for	The energy savings will be calculated the total hours for that month:	The energy savings will be calculated by multiplying the saving per motor by the quantity listed in section 1 for the total hours for that month:	ıuıcıpıyıng	tne saving	g per moto	r by tne q	uantity iisi	red in secti	r uo		
* 744 for Jan, Mar, May, Jul, Aug, Oct, & Dec														
52 * 672 for Feb 8 Nov														
	portional to	these va	lues											
	MOLEGANI ISINOO GINA GINAMAGI MOLETIGINOO 300 G. MOLETOSIO	0 4 0		Ė				CITORAL	2					
50 57	10N	- DAS			DEIVIAIN	U AND	COINS	JINE IIC	2					
28							Enel	Energy Demand (kw)	id (kw)					
59		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
09	100%	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
61	Other													0.0
62 M	Maximum	0.0	0.0	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	67.1	0.0	67.1
64							Ener	Energy Usage (kw-hr)	(kw-hr)					
9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
99	100%	0	0	0	0	0	0	0	0	0	0	0	0	0
29	Other	0	0	19,929	19,191	19,191	19,929	19,191	32,611	19,191	19,191	19,191	0	187,613
89	Total	0	0	19,929	19,191	19,191	19,929	19,191	32,611	19,191	19,191	19,191	0	187,613
69														

A B C D E F	Ξ 5	-	_	\times	_	Σ	z	0	۵	Q	~	S	—	n
1 ENERGY SAVINGS CALCULATIONS - INPUT DATA 2 VARIABLE FREQUENCY DRIVE (VFD)	INPUT DATA		er "20	11-12-	13 Revi	sed Pai	Per "2011-12-13 Revised Part 2.pdf"	=						
3 SECTION 1 - GENERAL INFORMATION	ZI													
6 Applicant name Valley Asphalt Corp.													App No. 1	11-423
7 Facility name 4850 Stubbs Mill Rd, Morrow Ohio							İ	į					Rev.	0
70	SECTION 5	- PROF	OSED	DEMAN	ID AND	CONS	- PROPOSED DEMAND AND CONSUMPTION	Z						
72							Ener	Energy Demand (kw)	d (kw)					
73	% of Full Load Capacity of Driven Equipment	Jan	Feb	Mar	Apr	May	Jun	lut	Aug	Sep	Oct	Nov	Dec	Annual
74	100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	%06	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
76	%08	0.0	0.0	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	0.0	53.7
77	%02	0.0	0.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	0.0	47.0
78	%09	0.0	0.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	0.0	40.5
79	20%	0.0	0.0	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	0.0	33.9
80	40%	0.0	0.0	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	0.0	27.3
81	30%	0.0	0.0	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	0.0	20.6
82	20%	0.0	0.0	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	0:0	13.8
200		9 6	0.0	0.0	6.0	20.0	6.0	6.0	0.0	5.0	0.0	5.0	0.0	6.0
84	Maximum	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
85														
98	% of Full Load Capacity						Ener	Energy Usage (kw-hr)	kw-hr)					
87	of Driven Equipment	Jan	Feb	Mar	Apr	Мау	Jun	lul	Aug	Sep	Oct	Nov	Dec	Annual
88	100%	0	0	0	0	0	0	0	0	0	0	0	0	0
68	%06	0	0	3,623	4,227	3,925	5,133	4,831	5,435	5,435	4,529	3,925	0	41,066
06	%08	0	0	2,684	2,684	2,684	4,026	3,758	3,758	4,026	3,758	3,221	0	30,598
91	%02	0	0	2,349	2,349	2,114	1,879	1,879	2,349	1,879	1,879	1,879	0	18,553
92	%09	0	0	1,619	1,619	1,619	1,214	1,214	1,619	1,417	1,214	1,214	0	12,749
93	20%	0	0	1,017	1,017	1,356	1,017	848	848	1,017	848	848	0	8,816
94	40%	0	0	545	545	545	545	545	545	818	545	818	0	5,455
95	30%	0	0	411	411	411	411	308	308	411	411	411	0	3,496
96	20%	0	0	276	276	276	276	276	276	276	276	276	0	2,481
97	10%	0	0	0	0	0	0	0	0	0	0	0	0	0
86	Total	0	0	12,525	13,129	12,931	14,502	13,659	15,138	15,279	13,460	12,592	0	123,214
100	SECTION 6 - SAVINGS	S - SAVII	NGS											
102		Jan	Feb	Mar	Apr	May	Jun	lnt	Aug	Sep	Oct	Nov	Dec	Annual
103	Energy Demand (kw)	0.0	0.0	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	0.0	60.4
104	Energy Use (kw-hr)	0	0	7,404	6,062	6,260	5,427	5,531	17,473	3,912	5,731	665'9	0	64,399

Ohio Mercantile Self Direct Program

Application Guide & Cover Sheet

Questions? Call 1-866-380-9580 or visit www.duke-energy.com.

Email this form along with <u>completed Mercantile Self Direct Prescriptive or Custom applications</u>, proof of payment, energy savings calculations and spec sheets to <u>SelfDirect@Duke-Energy.com</u>. You may also fax to 1-513-419-5572.

bpor interest of section of secti
Mercantile customers, defined as using at least 700,000 kWh annually are eligible for the Mercantile Self Direct program. Please
indicate mercantile qualification:
a single Duke Energy Ohio account
multiple accounts in Ohio (energy usage with other utilities may be counted toward the total)
— -
and the state of t

Please list Duke Energy account numbers below (attach listing of multiple accounts an/or billing history for other utilities as required):

Account Number	Annual Usage	Account Number	Annual Usage
0840361601	302760	8410371101	623707
3900369201	362717		
2730214301	323903		
4390368601	234161		

Self Direct rebates are available for completed Custom projects that have not previously received a Duke Energy Smart \$aver® Custom Incentive. Self Direct incentives are applicable to Prescriptive measures that were installed more than 90 days prior to submission to Duke Energy and have not previously received a Duke Energy Prescriptive rebate.

Self Direct Program requirements dictate that certain projects that may be Prescriptive in nature under the Smart \$aver program must be evaluated using the Custom process. Use the table on page two as a guide to determine which Self Direct program fits your project(s). Apply for Self Direct projects using the appropriate application forms in conjunction with this cover sheet. Where Mercantile Self Direct Prescriptive applications are listed, please refer to the measure list on that application. If your measure is not listed, you may be eligible for a Self Direct Custom rebate. Self Direct Custom applications, like Smart \$aver Custom applications, should include detailed analysis of pre-project and post-project energy usage and project costs. Please indicate which type of rebate applications are included in the table provided on page two.

Please check each box to indicate co	mpletion of the following prog	gram requirements:	
All sections of appropriate application(s) are completed	Proof of payment.*		Energy model/calculations and detailed inputs for Custom applications

^{*} If a single payment record is intended to demonstrate the costs of both Prescriptive & Custom projects, please include an additional document with an estimated breakout of costs for each Prescriptive and Custom energy conservation measure.

Application Type	Replaced equipment at end of lifetime or because equipment failed**	Replaced fully operational equipment to improve efficiency***	New Construction
Application Type		MSD Prescriptive Lighting	MSD Prescriptive Lighting
Lighting	MSD Custom Part 1 ☐ Custom Lighting Worksheet ☐	MSD Custom Part 1 ☐ Custom Lighting Worksheet ☐	MSD Custom Part 1 ☐ Custom Lighting Worksheet ☐
	MSD Custom Part 1	MSD Custom Part 1 □	MSD Prescriptive Heating & Cooling
Heating & Cooling	MSD Custom General Worksheet	MSD Custom General Worksheet	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
Window Films, Programmable Thermostats, & Guest Room Energy Management Systems	MSD Custom Part 1 ☐ MSD Custom General and/or EMS Worksheet(s) ☐	MSD Prescriptive Heating & Cooling	MSD Custom Part 1 ☐ MSD Custom General and/or EMS Worksheet(s) ☐
	MSD Custom Part 1	MSD Custom Part 1 □	MSD Prescriptive Chillers & Thermal Storage □
Chillers & Thermal Storage	MSD Custom General Worksheet	MSD Custom General Worksheet	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
	MSD Custom Part 1 □	MSD Custom Part 1 □	MSD Prescriptive Motors, Pumps & Drives □
Motors & Pumps	MSD Custom General Worksheet	MSD Custom General Worksheet	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
		MSD Prescriptive Motors, Pumps & Drives □	MSD Custom Part 1
VFDs	Not Applicable	MSD Custom Part 1 ⊠ MSD Custom VFD Worksheet ⊠	MSD Custom VFD Worksheet
		D . 1	MSD Prescriptive Food Service
Food Service	MSD Custom Part 1 MSD Custom General Worksheet	MSD Custom Part 1 MSD Custom General Worksheet	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐
		MSD Prescriptive Process	MSD Custom Part 1
Process	MSD Custom Part 1 MSD Custom General Worksheet	MSD Custom Part 1 ☐ MSD Custom General Worksheet ☐	MSD Custom General Worksheet
Energy Management Systems	MSD Custom Part 1 ☐ MSD Custom EMS Worksheet ☐	MSD Custom Part 1 ☐ MSD Custom EMS Worksheet ☐	MSD Custom Part 1 MSD Custom EMS Worksheet
Behavioral*** & No/Low Cost		MSD Custom Part 1 MSD Custom General Worksheet	

**** Behavioral energy efficiency and demand reduction projects must be both measurable and verifiable. Provide justification with your application.

^{**} Under the Self Direct program, failed equipment and equipment at the end of its useful life are evaluated differently than early replacement of fully functioning equipment. All equipment replacements due to failure or old age will be evaluated via the Custom program.

^{***} Please ensure that you include the age of the replaced equipment for measures classified as "Early Replacement" in your application as well as the estimated date that you would have otherwise replaced the existing equipment if you had not chosen a more energy efficient option.



Proposed energy efficiency measures may be eligible for Self-Direct Custom rebates if they clearly reduce electrical consumption and/or demand as compared to the appropriate baseline.

Before you complete this application, please note the following important criteria:

- Submitting this application does not guarantee a rebate will be approved.
- Rebates are based on electricity conservation only.
- Electric demand and/or energy reductions must be well documented with auditable calculations.
- Incomplete applications cannot be reviewed; all fields are required.

Refer to the complete list of Instructions and Disclaimers, beginning on page 6.

Notes on the Application Process

If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact your Duke Energy Ohio, Inc account manager or the Duke Energy Smart \$aver® team at 1-866-380-9580.

Every application must include calculations of the baseline electrical usage and the electrical usage of the proposed high-efficiency equipment/system. Monthly calculations are best. You, the Duke Energy Ohio customer, or your equipment vendor / engineer should perform these calculations and submit them to Duke Energy for review. We strongly encourage the use of modeling software (such as eQuest or comparable) for complex projects.

Upon receipt of your application, an acknowledgement email will be sent to you with an estimated response time based on an initial assessment of your application. The application review may include some communication to resolve any questions about the project or to request additional information. Applications that are received complete without missing information have a faster review time.

There are two ways to submit your completed application.

Email your scanned form to: SelfDirect@duke-energy.com

Or, fax your form to 513-419-5572



1. Contact Information (Required)

Duke Energy Cu	stomer Contact I	nformation					
Company Name	Valley Asphalt Co	rporation					
Address	11641 Mosteller	Road					
Project Contact	Fred Brammer						T
City	Cincinnati		State	Ohio		Zip Code	45241
Title	Plant Superinten	dant			1		
Office Phone	513-771-0820	Mobile Phone	513-5	35-6127	Fax	513-32	6-6788
E-mail Address	fred.brammer@j	rjnet.com					

Equipment Vend	or / Contractor / A	Architect / Engir	eer Co	ntact Info	rmation	1	
Company Name	F.D. Lawrence Ele	ectric Company					
Address	3450 Beekman St	reet					
City	Cincinnati		State	Ohio	Zip Co	de	45223-2743
Project Contact	Doug Eisen						
Title	Account Represe	ntative					
Office Phone	513-542-1100	Mobile Phone	513-8	307-9474	Fax	51	3-542-2422
E-mail Address	deisen@fdlawrei	nce.com					
Describe Role	Vendor						

					-	
Payment Information						
Payee Legal Company						
Name (as shown on	Valley Asphalt Corporation					
Federal income tax return):						
Mailing Address	11641 Mosteller Road					
City	Cincinnati	State	Ohio	Zip Code	45241	
Type of organization (check one) Individual/Sole Proprietor Corporation Partnership Unit of Government Non-Profit (non-corporation) Payee Federal Tax ID # of Legal 31-0515195						
Company Name Above: Who should receive incentive payment? (select one) Customer Must sign below)						
If the vendor is to receive payment, please sign below: I hereby authorize payment of incentive directly to vendor: Date / /(mm/dd/yyyy)						
Customer Signature Date/(\text{Imm.dd.})}						



2. Project Information (Required)

Α.	Please indicate project type: New Construction Expansion at an existing facility Replacing equipment due to equipment failure Replacing equipment that is estimated to have remaining useful life of 2 years or less Replacing equipment that is estimated to have remaining useful life of more than 2 years Behavioral, operational and/or procedural programs/projects
B.	Please describe your project, or attach a detailed project description that describes the project. Installed VFD tolower energy usage as well as demand, also to better control air flow thru plant.
C.	When did you start and complete implementation? Start date 12 / 09 (mm/yyyy) End date 5 / 10 (mm/yyyy)
D.	Are you also applying for Self-Direct Prescriptive incentives and, if so, which one(s) ¹ ?
E.	Please indicate which worksheet(s) you are submitting for this application (check all that apply): Lighting Variable Frequency Drive (VFD) Compressed Air Energy Management System (EMS) General (for projects not easily submitted using one of the above worksheets)
F.	Please tell us if there is anything about your electrical energy projections (either for the baseline or the proposed project) that you are either unsure about or for which you have made significant assumptions. Attach additional sheets as needed.

Required: Attach a supplier or contractor invoice or other equivalent information documenting the Implementation Cost for each project listed in your application. (Note: self-install costs cannot be included in the Implementation Cost)

¹ If your project involves some equipment that is eligible for prescriptive incentives and some equipment that is likely eligible for custom incentives, and if it is feasible to separate the equipment for the energy analysis, then the equipment will be evaluated separately. If it is not feasible to separate the equipment for analysis, then the equipment will be evaluated together in the custom application.



3. Signature (Required - must be signed by Duke Energy customer)

Customer Consent to Release of Personal Information

I, (insert name) Fred Brammer, do hereby consent to Duke Energy disclosing my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number to its subcontractors solely for the purpose of administering Duke Energy Ohio's Mercantile Self-Direct Program. I understand that such subcontractors are contractually bound to otherwise maintain my Duke Energy Ohio, Inc Account Number and Federal Tax ID Number in the strictest of confidence.

I realize that under the rules and regulations of the public utilities commission, I may refuse to allow Duke Energy Ohio, Inc to release the information set forth above. By my signature, I freely give Duke Energy Ohio, Inc permission to release the information designated above.

Application Signature

I certify that I meet the eligibility requirements of the Duke Energy Ohio, Inc Mercantile Self Direct Custom Incentives Program and that all information provided within this application is correct to the best of my knowledge. I agree to the terms and conditions set forth for this program. I certify that the numbers, energy savings, and responses shown on this form are correct. Further, I certify that the taxpayer identification number is current and correct. I am not subject to backup withholding because: (a) I am exempt from backup withholding; or (b) I have not been notified by the IRS that I am subject to backup withholding as a result of a failure to report all interest or dividends; or (c) the IRS has notified me that I am no longer subject to backup withholding. I am a U.S. citizen (includes a U.S. resident alien).

Duke Energy Ohio, Inc Customer Signature

Print Name FRED BRAMMER

Date 11-30-11

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Checklist for completing the Application

INCOMPLETE APPLICATIONS WILL RESULT IN DELAYS IN DUKE ENERGY PROCESSING YOUR APPLICATION AND NOTIFYING YOU CONCERNING AY REBATES. Before submitting the application and the required supplementary information, use the following checklist to ensure that your application is complete and the information in the application is accurate. (Note: this checklist is <u>for your use only</u> – do not submit this checklist with your application)

(140to: time errors	
Section No. & Title	Have You: The Duke Energy customer?
Contact Information	Have You: Completed the contact information for the Duke Energy customer? Completed the contact information for the equipment vendor / project engineer that can answer questions about the technical aspects of the project, if that is a different person than above?
2. Project	project, if that is a different person did used as description of your Answered the questions A-E, including providing a description of your
Information	project. Completed and attached the lighting, compressed air, VFD, EMS and/or General worksheet(s)?
3. Signature	Signed your name? ☐ Printed your name?
Supplementary information (Required)	Attached a supplier or contractor's invoice or other equivalent information documenting the Implementation Cost for projects listed in your application? (Note: self-install costs cannot be included in the Implementation Cost) (If submitting the General Worksheet) attached calculations documenting the energy usage and energy savings for each project listed in your application?

If you have any questions concerning how to complete any portion of the application or what supplementary information is required, please contact:

- your Duke Energy account manager
 or
- the Duke Energy Smart \$aver® team at 1-866-380-9580.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



Instructions/Terms/Conditions

Note: Please keep for your records- do not submit with the application

- Energy service companies or contractors may assist in preparing the application, but an authorized representative of the customer must sign this application to be eligible to participate in the Mercantile Self Direct Program. Completion of this application does not guarantee the approval of a Self Direct Custom Rebate.
- Once all documentation requested in this application is received by *Duke Energy Ohio, Inc,* and any follow-up information requested by *Duke Energy* is received, the rebate amount for each Energy Conservation Measure (ECM) will be communicated to the customer. The rebate amount will be based on ECM energy savings and ECM incremental installation cost.
- 3. All rebates require approval by the Public Utilities Commission of Ohio. *Duke Energy Ohio, Inc* will submit an application for rebate on the customer's behalf upon customer attestation to program terms, conditions and requirements as outlined in the rebate offer letter and upon customer completion of attestation documents required by the Public Utilities Commission of Ohio.
- 4. Duke Energy Ohio, Inc will issue a Self Direct Custom Rebate check, based on the approved rebate amount for each ECM, upon receiving approval from the Public Utilities Commission of Ohio. Duke Energy Ohio, Inc does not guarantee PUCO approval.
- 5. With the application, the customer must provide a list of all sites where the ECMs were installed. Duke Energy Ohio, Inc requests that sites of similar size, hours of operation and energy consuming characteristics be grouped together in one application for the determination of the rebate amount. The application should identify the site where each unique ECM was installed.
- Based on the information submitted with the application and the information gathered both before and after the initial installation of the ECM, *Duke Energy Ohio, Inc* will calculate the rebate amount for each ECM.
- 7. Duke Energy Ohio, Inc may conduct random site inspections of a sample of the locations where the ECMs are installed to verify installation and operability of the ECMs and to obtain information needed to calculate the Approved Incentive Amount.
- 8. Customers are encouraged to retain copies of all forms, invoices and supporting documentation for their records.
- 9. Approved rebates are valid for 6 months from the date communicated to the customer by *Duke Energy Ohio, Inc,* subject to the expiration of measure eligibility based on project completion dates and application submission deadlines as defined by PUCO. Customers are encouraged to execute their rebate offer contracts and PUCO-required affidavits promptly to ensure eligibility is not forfeited.
- 10. Duke Energy Ohio, Inc reserves the right to recover all unrecoverable costs associated with the project approval if the customer decides not to execute the rebate contract, after the project is approved by Duke Energy Ohio, Inc.
- 11. Projects financially supported by other funding sources will be evaluated on a case-by-case basis for potential partial funding from *Duke Energy Ohio*, *Inc*.
- 12. Participants must be *Duke Energy Ohio, Inc* nonresidential, mercantile customers with the project sites in the *Duke Energy Ohio, Inc* service territory.

Mercantile Self Direct Nonresidential Custom Rebate Application PART 1



- 13. Customers or trade allies may not use any Duke Energy logo without prior written permission.
- 14. Only trade allies registered with *Duke Energy* are eligible to participate.
- 15. All equipment must be new. Used or rebuilt equipment is not eligible for incentives. All old existing equipment must be removed on retrofit projects.
- 16. Disclaimers: Duke Energy Ohio, Inc.
 - a. does not endorse any particular manufacturer, product or system design within the program;
 - b. will not be responsible for any tax liability imposed on the customer as a result of the payment of incentives:
 - c. does not expressly or implicitly warrant the performance of installed equipment. (Contact your contractor for details regarding equipment warranties.);
 - d. is not responsible for the proper disposal/recycling of any waste generated or obsolete or old equipment as a result of this project;
 - e. is not liable for any damage caused by the installation of the equipment nor for any damage caused by the malfunction of the installed equipment; and
 - f. reserves the right to change or discontinue this program at any time. The acceptance of program applications is determined solely by *Duke Energy Ohio, Inc.*

ELECTRICAL MATERIALS

Invoice Information Type Number Level Date RO 310893 00 12/03/09 Customer PO/JOB# 0205

REPRINTED INVOICE

3450 BEEKMAN STREET CINCINNATI, OHIO 513-542-1100 FAX 542-2422

հետևերդեն գումեր Արևերդեն և հայեր

VALLEY ASPHALT COMPANY ATTN ACCOUNTS PAYABLE

452232743

<u>Inside Salesperson</u> Ship Date 08 JOE KELLEY 2/01/09 Outside Salesperson Acct# 12 DOUG EISEN 959200 Ship Via

Ship To Information Below: MONROE PLANT

581 GARVER RD

11641 MOSTELLER ROAD CINCINNATI OH 45241-1520)			MOM	IROE OH 450)50		
Remit check to The F.D. Lawrence Elec	ctric Co	L-613	6 CINCI	NNA1	'I OH 45270 Omit Price) – 6 UM	136 Dis	Net Amount
The Product Description of	1		1		5849.00	E	1	5849.00
1 SQD 8839EFDSG4VYA07B08 100HP 460V EFLEX-MCB 100KAIC, BYPASS, 3 SEL SWS,	4 P/L'S	, N1	1		138.41			138.41
2 SQD VW3A3202 EXT I/O ATV61/71	1		<u> </u>		100.72			
						+-		
						-		
				-		_		
						-		
						+		
				+		+-	 	
		<u> </u>						
				+		+	-	
	<u> </u>							
				-		+		
						_		
						\dashv	-	
						_		
				+				
							Net	5.987.41
If your account is current and this invoice is paid by: 1/10/10 TAKE DIS	SCOUNT O	F 59 0111	9.87 OHIO/HAN	1 CO	EXEMPT		Tax	.00_
					12 of the Dair		otal	5,907.41

These goods were produced in compliance with all applicable requirements of section 6,7, and 12 of the Fair Labor Standards Act as amended and of regulation and orders of the United States Possets of the United States P Standards Act as amended and of regulation and orders of the United States Department of Labor

issued under Section 14 thereof. Returned merchandise or claims are subject to the conditions shown on sales tickets.

Merchandise shall not be returned without prior approval! all past due balances. REQUESTED BY: CINDI

THE F.D. LAWRENCE ELECTRIC CO. Listributors of ELECTRICAL MATERIALS

REPRINTED INVOICE

Invoice Information Type Number Level Date CJ 299723 00 10/12/09 Customer PO/JOB#

0214

3450 BEEKMAN STREET CINCINNATI, OHIO 513-542-1100 FAX 542-2422

452232743

<u>Inside Salesperson</u> Ship Date 10/07/09 08 JOE KELLEY Outside Salesperson Acct# 12 DOUG EISEN 959200 *Ship Via* BEST WAY

Ship To Information Below: VALLEY ASPHALT COMPANY

11641 MOSTELLER ROAD ATTN: RONNIE HOPKINS

CINCINNATI OH 45241 FDL/299723 4193J

Maddadalahallahdaddhadilladla

VALLEY ASPHALT COMPANY ATTN ACCOUNTS PAYABLE 11641 MOSTELLER ROAD OH 45241-1520 CINCINNATI

		check to The F.D.	Lawrence Elec	tric Co	. L-613	6 CINCI	NNA?	TI OH 45270	1-6	136	
$R\epsilon$	emıt	t Description/Customer	Designation	Ordered	Backord	Shipped	Non	Unit Price	UCT.	Dis	Net Amount
ine P	roduc	t Description/Customer	1.00.0000000000000000000000000000000000	1	Market Land Comment Comment	1	999	N/C	E	1	.00
$\frac{1}{2}$	SQD	VW3A3202 EXTENDED 8839EFDSH4VYA07B08	F-FLEX DRIVE	1		1_	999	N/C	E	1	.00
2	SUD	100HD 3D	L I LLX BIXE						<u> </u>		7666 00
3	SOD	100HP 3R LOT PRICE		1		1	999	7666.00	IE_	1	7666.00
- > 	SQU	LUITRIOL							┼-		
							 		╁╌	 	
							 - -		-		
							┼		+-	_	
					 	 	┼		1		
							 	-	1		
						1	1				
			<u> </u>	<u> </u>	 						
					-						
				-							
										┦-	
										-	
									-		
									+	┼	
										+-	
							-	<u> </u>	+	-	
						<u> </u>	-		+		
									+-	+-	
									_	+	
									+		
							+		-		
									+		
							-		\top		
											
				 	 	 	- -				
				-			_				
TF V	mir ac	count is current invoice is paid by: 11/10	I/NO TAKE DIS	COUNT OF	76	.66				Vet.	7.666.00
and	this	invoice is paid by: 11/10	HUS TAKE DIS	000111 01	0111	OHIO/HAM	l CO	EXEMPT	-	ľax	.00
									T	otal	7,666.00

These goods were produced in compliance with all applicable requirements of section 6,7, and 12 of the Fair Labor Standards Act as amended and of regulation and orders of the United States Department of Labor

issued under Section 14 thereof.

Returned merchandise or claims are subject to the conditions shown on sales tickets. Merchandise shall not be returned without prior approval! all mast due halances

REQUESTED BY: CINDI

THE F.D. LAWRENCE ELECTRIC CO. -Sistributors of ELECTRICAL MATERIALS

REPRINTED INVOICE

Invoice Information Type Number Level Date

CJ 233734 00 10/21/08 Customer PO/JOB#

3450 BEEKMAN STREET CINCINNATI, OHIO 513-542-1100 FAX 542-2422

հեռեժունենոնովետենեունենուն

VALLEY ASPHALT COMPANY ATTN ACCOUNTS PAYABLE 11641 MOSTELLER ROAD

452232743

1401 <u> Inside Salesperson</u> Ship Date 08 JOE KELLEY 10/17/08 Outside Salesperson Acct# 12 DOUG EISEN 959200 Ship Via BEST WAY

Ship To Information Below: VALLEY ASPHALT COMPANY

1901 DRYDEN ROAD

DAYTON OH 45439 FDI /233734 3906J

Dem	it chec	k to T	he F.D	. Law	rence	Elec	tric	Со	L-61	3 <i>6 CI</i>	NCI	NNAT	I OH	45270	-61 UM	.3 <i>6</i> 51s ∏	Net	Amount
	duct Desc	wintion	/Custome	r Desi	gnation	1	rdere	≥d	. д-од Backord	Shipp	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		01.0	2.39	F	1	81	92.39
PTO	D ATV61	LICOON.	4 SDEED	DRIV	F 350	HP		1			1	999	815	12,39	-			
S	JD AIAPT	MUZZIV	+ 31 LLD	Ditt	<u></u>					\ <u> </u>					-			
									<u></u>	1		 						
		<u></u>													\vdash			
 										 					1-1	- 1		
┼-										 					+-	-		
╁															╁			
-															+-			
-															+			
╄															+-			
_															+-			
												-	<u> </u>		╁╌			
							ļ						<u> </u>		-	 		
							 									-		
							1									<u> </u>	 	
							 						<u> </u>		_			
1							+						<u> </u>		+		 	
							+-						<u> </u>				 	
							┼─								_			
													<u> </u>			—	 	
							+					\top			4	<u> </u>	 	
									 			\top						
\neg										_								
						<u> </u>	-										 	
_																		
_																		
												_					<u> </u>	
_												_						
																	<u> </u>	
\dashv													-					
										-+-			+					
																Net	8.	192.39
+ 17	ur account his invoic	is curr	ent 11	/10 /00	TAK	E DIS	COUN	IT C)F 8	0HIO				_		Tax		. 0

These goods were produced in compliance with all applicable requirements of section 6,7, and 12 of the Fair Labor
Standards Act as amended and of regulation and orders of the United States Department of Tabor

Returned merchandise or claims are subject to the conditions shown on sales tickets. changise of claims are believed without prior approval! all mast due balances.

REQUESTED BY: CINDI

THE F.D. LAWRENCE ELECTRIC CO. ELECTRICAL MATERIALS

Invoice Information Type Number Level Date CJ 299720 00 10/12/09 Customer PO/JOB# 0217

REPRINTED INVOICE

3450 BEEKMAN STREET CINCINNATI, OHIO 513-542-1100 FAX 542-2422

452232743

<u>Inside Salesperson</u> Ship Date 08 JOE KELLEY 0/07/09 Outside Salesperson Acct# 12 DOUG EISEN 959200 Ship Via BEST WAY

Ship To Information Below: VALLEY ASPHALT COMPANY

11641 MOSTELLER ROAD ATTN: RONNIE HOPKINS

CINCINNATI OH 45241 FDL/299720 4193J

- հեռևնես ենևականակեն անվես	allal

VALLEY ASPHALT COMPANY ATTN ACCOUNTS PAYABLE 11641 MOSTELLER ROAD OH 45241-1520 CINCINNATI

R	Remit check to The F.D. Lawrence Elect	tric co.	, <u>п</u> -ото	a samad	Inon I	Just Price	UM	Dis	Net Amount
ŀ	product Description/Customer Designation L	orgered .	Backoro		999	N/C			.00
۲	COD VUIZAZZOZ EXTENDED I/O CARD	1		1	999	N/C	TE.		.00
+	SQD 8839EFDSH4VYA07B08 E-FLEX DRIVE	1		11	1999		+		
1	ARK: 100HP 3R	!		1	999	7666.00	TF.	11	7666.00
+	SQD LOT PRICE	1		11	1997	/ 000.00	+	+	
+	SUD LOT TIME	<u> </u>		-	+		+	1	
+		<u> </u>	<u> </u>		+-+		+	+ +	
+				<u> </u>	+		+	+	
4						r .	+	+	
_						ſ -	+	+	
							+	+-+	
_			T		\perp		+	+-+	
_					\perp		+	+-+	
_					<u> </u>	 	+	+-+	
_					'	1	+	+-+	
_		+			'	1	+	+-+	
		+	1			1			
_		+					_	+-+	
_		+					-+		
_		+			7		_		
_		 	+						
_			-				_		
		+	+						
_			+	+					
_					_				
_					_				
_				_	_				1
_					-	+			·
-					-	+		,	
_					+-	+		,	
_							-		
_					-+-	+	+		
_		Τ							
								Net	7,666,00
Ŧ	your account is current of this invoice is paid by: 11/10/09 TAKE DIS	COUNT 0	√F 71	6.66	- 0			Tax	.0
an	id this invoice is paid by: 11/10/05		0111	OHIO/HA	νM CO	EXEMPI	2000	Total	7,666.0

These goods were produced in compliance with all applicable requirements of section 6,7, and 12 of the Fair Labor Standards Act as amended and of regulation and orders of the United States Department of Labor

Returned merchandise or claims are subject to the conditions shown on sales tickets.

ned merchandise of claims and without prior approval! all most due balances.

THE F.D. LAWRENCE ELECTRIC CO. Distributors of ELECTRICAL MATERIALS

REPRINTED INVOICE

Invoice Information Type Number Level Date CJ 213424 01 8/15/08

Customer PO/JOB#

0022266000

3450 BEEKMAN STREET CINCINNATI, OHIO 513-542-1100 FAX 542-2422

հեռեվուժեն ակակեն հետև Արավել

VALLEY ASPHALT COMPANY

ATTN ACCOUNTS PAYABLE

11641 MOSTELLER ROAD

452232743

Inside Salesperson Ship Date 08 JOE KELLEY 8/12/08 Outside Salesperson Acct# 12 DOUG EISEN 959200 Ship Via BEST WAY

Ship To Information Below: VALLEY ASPHALT COMPANY

11641 MOSTELLER ROAD ATTN: CARD HOFFER

CINCINNATI OH 45241 FDL/213424 3827J

OH 45241-1520 CINCINNATI Remit check to The F.D. Lawrence Electric Co. L-6136 CINCINNATI OH 45270-6136 Net Amount Ordered Backord Shipped Non Unit Price UM Dis Line Product Description/Customer Designation 5453.00 5453.00 E 1 999 1 SQD 8839EFDSG4VYA07B08 5.453.00 Net If your account is current and this invoice is paid by: 9/10/08 TAKE DISCOUNT OF 54.53 00 Tax 0111 OHIO/HAM CO EXEMPT 5,453.00 Total

These goods were produced in compliance with all applicable requirements of section 6,7, and 12 of the Fair Labor Standards Act as amended and of regulation and orders of the United States Department of Labor REQUESTED BY: CINDI

Returned merchandise or claims are subject to the conditions shown on sales tickets.



Variable speed drives for asynchronous motors

Altivar 61: Reduction of current harmonics Option: DC chokes

The main solutions for reducing current harmonics are as follows:

- DC chokes, see below
- Line chokes, see page 2/228
- # 16% and 10% passive filters, see page 2/231
- Use of passive filters with a DC choke, see pages 2/231 to 2/235

These 4 solutions can be used on the same installation.

It is always easier and less expensive to handle current harmonics at installation level as a whole rather than at the level of each Individual unit, particularly when using passive litters and active compensators.



DESIGNATION OF THE PROPERTY OF DC chokes are used to reduce current harmonics in order to comply with standard IEC 61000-3-12 for drives on which the line current is greater than 16 A and less

Using the DC choke with the drive compiles with standard IEC 61000-3-12 provided that the RSCE > 120 (1) at the point of connection to the public network. 120 represents the minimum value of RSCE (1) for which the values in table 4 of standard IEC 61000-3-12 are not exceeded.

It is the responsibility of the installer or the user to ensure that the device is connected correctly to a connection point with an RSCE ≥ 120. The DC choke is connected to the drive power terminals.

15 5 50 50 B D

If is supplied as standard with ATV 61HD55M3X, HD90M3X and ATV 61HD90N4...HC63N4 drives and is integrated into ATV 61WeeN4 and ATV 61WeesN4C drives.

Applications

Reduction of current harmonics. Reduction of THD to 5% or to 10% in association with passive filters, see pages 2/231 to 2/235. Maintaining the motor torque in relation to the line choke.

(1) Short-circuit ratio

L1 — M L2 — M L3 — Alivar 61	

Post-it® Fax Note 7671	Date 1/24/08 # of pages 5
To Fred Brammar	From Sand Vimbal
Co./Dept.	Co. SQUONED
Phone # .	Phone #
Fax # 513. 326. 3662	Fax # 919. 217. 6508

in the state of th

Altivar® 61 Drives Electrical Specifications

Input Voltage	200-15% 10-240-100/- 200-450/-
Displacement Power Factor	200 -15% to 240 ±10%, 380 -15% to 480 ±10% 98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Dave Output Section	Three Phase, IGBT Inverted with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (in the control of th
Frequency Range of Power Converter	0.5 to 500 Fb
Torque/overtorque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s. minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1.50 km @ 2004016
Speed Reference Inputs	Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V125-900 hp @ Al. 0.to+10 V Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms Al2: Factory setting = 4 to 20mA, software configurable for current, (0-20mA, X-Y) or voltion to the time of the current of the time of the current of the cur
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
VO Sampling Time	2 ms -/- 0.5 ms on analog inputs & outputs, & logic inputs, 7 ms, -/- 0.5 ms on relay out
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unitended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands
The state of the s	Energy aconomizer (flux entimization)
Motor Control Profiles	Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load.) or select from 2 point or 5 point volts/he or SLFV (sensorless flux vector)
Speed Range	to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set up menu, network set up menu, Logic I/O & Analog I/O mapp status, Monitoring and self-disensatics with fault
The same of the sa	
The state of the s	nons and week (Waste Electrical & Electronic Equipment compliant
Codes and Standards	UL, CSA, NOM 11가 DNV, CE, C-Tick, GOST UL 1995 Plenum rated, SEMLF47 comilied for voltage dip nde-through

Altivar® 61 Drives Environmental Specifications

Temperature	
Humidity	Operation: 14 to + 122 F (-10 to +50 C) Storage: 13 to +158 F (-25 to +70 C)
THE TWO INSTRUMENTAL CONTROL OF A STANDARD AND A ST	3576 With no condensation or dripping water, conforming to IEC sooces 2.3
Altitude	3,300 ft; (1,000 m) without derating; 3,300-9850 ft (1,000-3,000 m) derate cutput current each additional 330 ft; (100 m), 6560 ft (2000m) maximum for corner grounded distributions.
	1-60 hp @ 200/240 V. 1-100 hp @ 380/480 V.
Enclosure Rating	IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V:
MAN JOS WASSERS OF THE STATE OF	IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600 -900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Charles The Control of the Control o	
	17-20 hp @ 200/240 V 1/25 hp @ 380/480 V: Pollution degree 2 per IEC/EN 61800-6-1, Option S337 provides projection per IEC 60721-3-3 Class 3C2
Pollution Degree	The state of the s
C:\Documente@20a=40/20a	60-125hp @ 200/240 V, 125-900 hp @ 380/480V: Pollution degree 3 per IEC/EN 61800-1

E-FlexTM Enclosed Drive Controllers

Adjustable speed solutions for HVAC and pump applications







Industrial-grade reliability designed for HVAC

Square D[®] E-Flex[™] AC drives provide the optimum combination of efficiency and economy for HVAC, pump and fan applications in both commercial and industrial environments. They are the ideal choice in adjustable speed drive solutions for applications such as:

- Air Handling Units
- Supply and Return Fans
- Exhaust Fans
- Chilled Water Pumps
- Hot Water Pumps
- Cooling Tower Fans and Pumps



Seismic Qualification for New Generation of Building Codes: from the first drive manufacturer to meet seismic criteria

Square D E-Flex enclosed drive controllers are designed to meet International Building Code and ASCE 7 standards for seismic qualification in accordance with ICC ES AC156 testing protocol. Many states and jurisdictions are beginning enforcement of the seismic guidelines for installed equipment contained in the International Building Code.

E-Flex enclosed drive controllers were subjected to actual shaker table tests for seismic ratings, not just theoretical calculations for seismic ratings or obsolete requirements of the Uniform Building Code. The E-Flex enclosed drive controller provides structural integrity when installed to published guidelines and can be specified for use in applications that require Ip = 1.5, which means operational status can be restored after a seismic event.

Enclosure Styles

Square D E-Flex enclosed drive controllers can meet both indoor and outdoor application requirements with Type 1, Type 12/12K and Type 3R enclosures.

- Type 1 enclosures are designed specifically for indoor, non-dusty environments.
- Type 12/12K enclosures are designed for protection from dust and dripping liquid.
- Type 3R enclosures permit installation on rooftops or other outdoor locations to free up space in mechanical equipment rooms. Plus, Type 3R enclosures allow operations in temperature ranges from +14°F to +122°F (-10°C to +50°C).



Energy Efficiency

Square D E-Flex enclosed drive controllers can increase system energy efficiency by providing a means to reduce the motor speed of HVAC equipment based on the needs of the building environment (lower motor speed = lower energy costs).

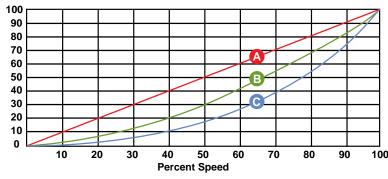
Energy savings can be realized because of the Affinity laws of physics:

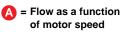
- Flow = f (motor speed)*
- Pressure = f (motor speed)²
- Horsepower = f (motor speed)³

A motor running at 50% of full speed capacity has a motor torque of 25% of full speed. In addition, electricity required to operate the motor at 50% of full speed is 12.5% of the amount of electricity required if the motor was running at 100% full speed capacity. Thus, reducing motor speed can significantly reduce the electrical energy consumption.

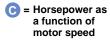
















An Example Energy Saving Calculation**

A fan with a 20 horsepower motor supplies air 10 hours a day for 260 days a year and the energy cost is \$0.10 cents per kilowatt-hour.

Cost of running full speed:

20 hp x 0.746 kW/hp x 2600 hours x \$0.10/kWhr = \$3879.20

Assuming the fan does not need to run at full speed all of the time, let's use an example of:

- Running full speed (100%) for 25% of the time
- 80% speed for 50% of the time
- 60% speed for the remaining 25% of the time

Cost of running with an AC drive controlling the motor:

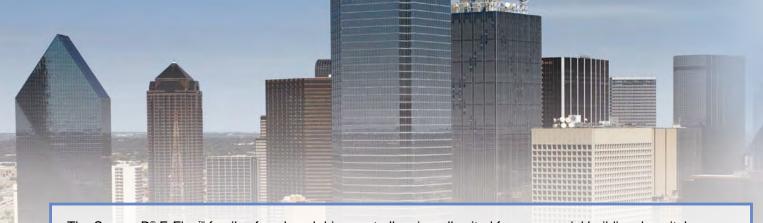
Total = \$2172.36

Annual savings: \$3879.20 - \$2172.36 = \$1706.84

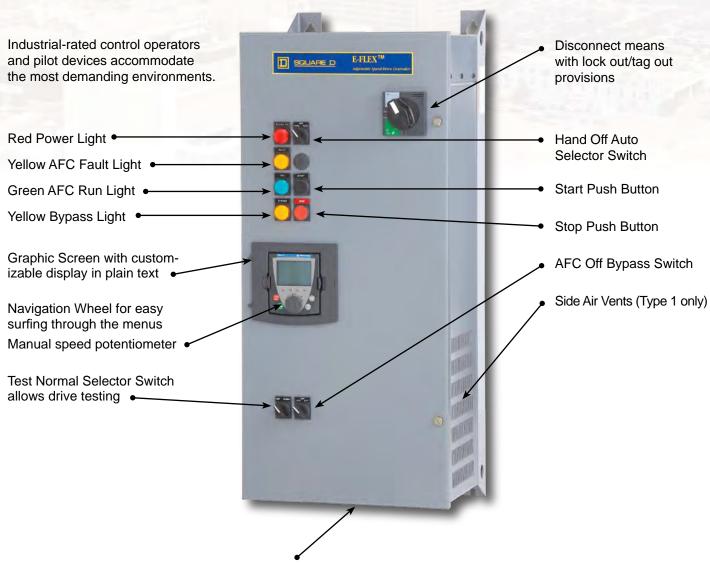
 In many instances, the payback period for using an adjustable frequency drive in place of other flow control methods is less than 18 months.

^{*} Flow as a function of motor speed.

^{**}Actual results may vary for closed loop pumping and variable air volume systems.



The Square D® E-Flex™ family of enclosed drive controllers is well suited for commercial building, hospital, and school HVAC applications requiring a disconnect and bypass. These controllers offer a compact metal enclosure designed to reduce Radio Frequency Interference (RFI). In addition, HVAC specific control interface is pre-programmed for HVAC variable torque operation to permit ease of set-up and installation. HVAC controls provide end damper control, smoke purge relays and fire/freezestats for full-speed fire safety override and lock-out terminations.



Pre-punched top and bottom conduit entry knock-outs simplify electrical installation and prevent metal filings from getting inside the enclosure (Type 3R enclosures have bottom conduit entry only)

Fully-rated, AC3 duty-rated motor isolation and bypass contactors with mechanical and electrical interlocks prevent accidental voltage back feed. The adjustable carrier frequency is optimized at 8 kHz to reduce motor noise levels and is programmable from 0.5 kHz to 16 kHz. The advanced ASIC technology platform increases reliability and uptime and lowers the component count. The motor soft start inherent in the drive reduces mechanical stress and routine maintenance.

A 3% line reactor is included as standard and provides transient protection from surge and overvoltage, while minimizing line harmonic currents.

5% line reactor is optional

Type 2B wiring simplifies wiring identification and termination to industrial-rated terminals

Motor isolation and bypass contactors for emergency full-speed operation

3–15 PSI pressure transducer input for retrofit applications Circuit breaker disconnect (L1, L2, L3) provides short circuit protection without current limiting fuses

Control transformer

Altivar® 61 drive power converter with 6-pulse bridge rectifier input and IGBT inverter with pulse width modulated output

Customer interface terminal blocks

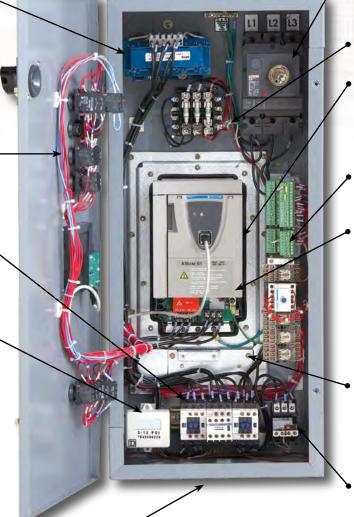
Integrated Modbus® and CANopen port

Serial communication card options include LonWorks®, BACnet®, Ethernet, Profibus, Modbus® Unitelway, Apogee P1 and Metasys® N2 protocols

Front removable heat sink fan assembly eliminates rear access requirements, improving maintenance and minimizing downtime

Motor terminal connection bypass circuit (T1, T2, T3)

UL 508C listed and coordinated with NEMA ICS 7.1 standards to exceed minimum UL short-circuit requirements (this structural integrity will provide enhanced personnel safety under short-circuit conditions for the drive and bypass operation)



Selection Guide

The controller catalog number, located on the inside of the door, is coded to describe the configuration and options present. Use the following grid to translate the catalog number into a description of the controller.

Class Type Modifications Control Control Light Misc. 8839 EFD •

1 Product

Code	Drive Type
EFD	E-Flex Controller

2 Horsepower Code

	001101 OOUO		
Code	HP Rating	Code	HP Rating
С	1	L	25
D	2	М	30
E	3	N	40
F	5	Р	50
G	7.5	Q	60 (460 V only)
Н	10	R	75 (460 V only)
J	15	S	100 (460 V only)
K	20		
		'	

3 Enclosure Type

Code Environmental Rating					
Α	Type 12K				
G	Type 1				
Н	Type 3R				

4 Voltage Rating

Code	Voltage
2	208 V
3	230 V
4	460 V

5 Application Type

Code	Applied Rating
V	Variable Torque

6 Device Type

Code	Power Circuit				
W ^[5]	Without Bypass				
Y [8]	Bypass				

- Control option C07 (Start/Stop, Speed Potentiometer) is not compatible with Power Circuit Y Bypass or Light Option A08 or B08.
- [2] Light Option A08, B08 and C08 cannot be selected together. Select only one.
- [3] Light Option B08 is not compatible with Power Circuit W (Without Bypass).
- [4] Light Option C08 is not compatible with Control Options A07 (Hand-Off-Auto, Speed Potentiometer), B07 (Hand-Off-Auto, Start-Stop, Speed Potentiometer), D07 (Hand-Off-Comm, Speed Pot.) or E07 (Hand-Off-Comm, Start-Stop, Speed Pot.)
- [5] Line Contactor B09 is not compatible with Power Circuit W (Without Bypass).
- [6] Smoke purge E09 permits the motor to run at full speed.
- [7] Hand-Off-Auto switch must be placed in Off position for AFC fault reset.
- [8] Includes AFC-Off-Bypass switch and Test-Normal switch.
- [9] D07 or E07 must be selected.

7 Control Option

	1++++L1.1.1.1.1.1.2.2.2.2.2.2.2.2.2.2.2.2.2.2						
Code	AFC Controls						
A07 [7]	Hand-Off-Auto, Speed Potentiometer						
B07 [7]	B07 [7] Hand-Off-Auto, Start-Stop, Speed Potentiometer						
C07 [1]	O7 [1] Start-Stop, Speed Potentiometer						
D07)7 Hand-Off-Comm, Speed Potentiometer						
E07	Hand-Off-Comm, Start-Stop, Speed Potentiometer						
N07	None						
	1.10.10						

8 Light Option

-	Light option					
	Code	Light Cluster				
	A08 [2]	Red Power On				
		Green AFC Run				
		Yellow AFC Fault				
		Yellow Auto				
	B08 [2], [3]	Red Power On				
		Green AFC Run				
		Yellow AFC Fault				
		Yellow Bypass				
	C08 [2], [4]	Red Power On				
		Green AFC Run				
		Yellow AFC Fault				

9 Miscellaneous Option

Miscenarieous Option					
Feature					
Line Reactor, 5%					
Line Contactor					
3–15 PSI Transducer					
Omit Keyboard					
Smoke Purge (Fireman's Override)					
Profibus					
I/O Extension Card, 0–20 mA					
J09 [12] 0-10 Vdc Differential Input					
K09 cUL Listing Certification					
L09 [14], [9] LonWorks					
M09 [14], [9] Modbus Unitelway					
Apogee P1					
Metasys N2					
Q09 [14], [9] Ethernet TCP/IP					
R09 [14], [9] BACnet					
End Damper Control					
U09 Seismic Qualification					

- [10] C09 3–15 PSI Transducer is not compatible with C07 Start-Stop, Speed Potentiometer, J09 0-10 V Auto Speed Reference or H09 Analog Card.
- [11] H09 Analog Card is not compatible with C09 3–15 PSI Transducer or Serial Communication F09, L09, M09, O09, P09, Q09, R09.
- [12] J09 0-10 V Differential Input is not compatible with C07 Start-Stop Potentiometer or C09 3-15 PSI Transducer.
- [13] Omit the keypad D09. User must buy a separate device to program the controller.
- [14] Serial communication F09, L09, M09, O09, P09, Q09 and R09 cannot be selected together. Select only one. Serial communication cannot be selected with H09.

Electrical Specifications

Input Voltage	208 V ±10%, 230 V ±10%, 460 V ±10%
Displacement Power Factor	98% through speed range
Input Frequency	60 Hz +/- 5%
Output Voltage	Three-phase output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.1 to 500 Hz (factory setting of 60 Hz)
Torque/Overtorque	110% of nominal motor torque for 60 s
Current (Transient)	110% of controller rated current for 60 s
Switching Frequency	Selectable from 0.5 to 16 kHz $^{\tiny{[1]}}$ Factory setting: 8 kHz for 208 V, 230 V and 1-100 hp @460 V
Speed Reference	Al1: 0 to +10 V, Impedance = 30 k Ω Can be used for speed potentiometer, 1–10 k Ω Al2: Factory setting: 4 to 20 mA, Impedance = 242 Ω
Factory Resolution in Analog Reference	0.1 for 100 Hz (11 bits)
Speed Regulation	V/f control: equal to the motor's rated slip SLFV (sensorless flux vector): 10% of motor's rated slip from 20% to 100% of nominal motor torque.
Efficiency	97% at full load typical
Reference Sample Time	2 ms ±0.5 ms
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Drive Controller Protection	Thermal protection of power converter Phase loss of AC mains circuit breaker rated at 100 kAIC
Motor Protection	Class 10 electronic overload protection Class 20 electromechnical overload protection with bypass [2]
Graphic Display Terminal	Self diagnostics with fault messages in three languages also refer to the Programming Manual, supplied on CD-ROM W817574030111 with power converter.
Codes and Standards	UL Listed per UL 508C under category NMMS. Conforms to applicable NEMA ICS, NFPA, and IEC standards. Manufactured under ISO 9001 standards.

^[1] On 1-100 hp VT controllers, above 8 kHz, select the next largest drive controller.

Environmental Specifications

Temperature	Storage for all enclosures: -13°F to +149°F (-25°C to +65°C) Operation: +14°F to + 104°F (-10°C to +40°C).
Humidity	95% with no condensation or dripping water, conforming to IEC 60068-2-3.
Altitude	3,300 ft. (1,000 m) maximum without derating; derating of current by 1% for each additional 330 ft. (100 m)
Enclosure	Type 1, Type 12/12K, and Type 3R
Polution Degree	Type 1: Polution degree 2 per NEMA ICS-1 Annex A and IEC 60664-1 Type 12/12K: Pollution degree 3 per NEMA ICS-1 and IEC17.560664-1
Operational Test Vibration	Conforming to IEC 60721-3-3-3M3 amplitude 1.5 peak to peak from 3 Hz to 13 Hz 1g from 13 Hz to 200 Hz
Transit Test to Shock	Conforming to National Safe Transit Association and International Safe Transit Association test for packages
Operational Shock	15 g, 11 ms
Seismic Qualification	2003 IBC, NFPA 5000, and ASCE 7 ICC ES AC156 acceptance criteria test protocol with importance factor of 1.5

^[2] Class 10 electromechanical for 1 hp at 460 V.

Schneider Electric is a global supplier of electrical distribution, automation and control equipment products under the brand names of Square D®, Telemecanique® and Merlin Gerin®. For over 100 years, Schneider Electric has been an innovator in manufacturing products that are tailored to the demanding specifications of our customers. Backed by a global organization of 80,000 employees in 130 countries, Schneider Electric is a global electrical industry leader. With one of the strongest distribution networks in the U.S. and around the world, you can count on Schneider Electric to keep your business running smoothly and efficiently.

Schneider Electric has been providing adjustable frequency drive solutions for HVAC and pumping applications for over 30 years. Schneider Electric has made a significant investment in research and development to design a new generation of products to serve the HVAC and pumping marketplace.

Dimensions and Weights

Type 1 or Type 12K Enclosures

HP		Height		Width		Depth		Weight	
208/230 V	460 V	mm	in.	mm	in.	mm	in.	kg.	lbs.
1–5	1–7.5	889	35	374.9	14.76	353.91	13.93	37.7	83
7.5–10	10–25	1041.4	41	521.21	20.52	353.91	13.93	57.2	126
15–25	30–50	1244.6	49	524.51	20.65	427.49	16.83	80.5	177
30–50	60–100	1600.2	63	651.51	25.65	427.49	16.83	95.9	211

Type 3R Enclosures

HP		Height		Width		Depth		Weight	
208/230 V	460 V	mm	in.	mm	in.	mm	in.	kg.	lbs.
1–5	1–7.5	889	35	620.52	24.43	347.73	13.69	52.3	115
7.5–10	10–25	1041.4	41	766.83	30.19	347.73	13.69	74.1	163
15–25	30–50	1326.39	52.22	770.13	30.32	415.04	16.34	96.8	213
30–50	60–100	1681.99	66.22	897.13	35.32	415.04	16.34	112.3	247

For additional information on Square D[®] E-Flex[™] adjustable frequency AC drives, visit our website at www.us.squared.com.

Square D®, Telemecanique®, Merlin Gerin®, E-flex™, Altivar® and Modbus® are registered trademarks or trademarks of Schneider Electric. Other trademarks used herein are the property of their respective owners.

Schneider Electric - North American Operating Division

1415 S. Roselle Road Palatine, IL 60067 Tel: 847-397-2600 Fax: 847-925-7500